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tiles, recently published by Drs. Gray and Duméril. Of these may be mentioned the crocodile *Osteolemus tetraspis*, the turtle *Aspidonectes aspilus*, the tree-frog *Hyperolius fulvivittatus* and the serpent *Dasypeltis carinata* (*Dipsas carinata* Hallow). M. Duméril has united many of the supposed species which have been described as distinct; he has, however, not noticed Dr. Günther's identification of Hallowell's *Heteronotus triangularis* with his *Graya silurophaga*. As both the names for this genus have been previously employed, I have called it *Glaniolestes* in the "Hand-book to the Museum, Philadelphia Academy."

On the Classification and Synonymy of the recent species of PHOLADIDÆ.

BY GEORGE W. TRYON, JR.

In the year 1851, Dr. John Edward Gray proposed a very excellent arrangement of the genera of shells included by earlier conchologists in PHOLAS and TEREDO.* This arrangement has received the approval of most of the subsequent authors, who have treated on the subject, including Fischer, (Journ. Conchyl., 2d ser., iii. iv.), H. and A. Adams, (Genera of Recent Mollusca,) and Chenu, (Manuel, tome 2.)

S. P. Woodward, however, in his admirable Treatise on Conchology, part second, makes the following disposition of the *Pholades*:

Genus PHOLAS (including DACTYLINA, BARNEA, TALONA, etc.

"The differences in the dorsal shields are only of specific value."

Genus PHOLADIDÆA, subgenera MARTESIA, JOUANNETIA, PARAPHOLAS.

Genus XYLOPHAGA.

Mr. P. P. Carpenter, in his various works on the West Coast Mollusca, follows Woodward's arrangement.

The only other modern classification of the family with which I am acquainted, is that contained in Swainson's Malacology, which is as follows:

Order DITHYRA.

Tribe MACROTRACHLÆ.

Family PHOLIDÆ.

Genera ASPERGILLUM, CLAVAGELLA, FISTULANA, GASTROCHÆNA, PHOLADOMYA, PHOLAS, PHOLIDÆA, MARTESIA, XYLOPHAGA, TEREDO, TEREDINA.

I am much inclined to think that more than merely specific value should be attached to the number, form and position of the accessory valves, and I have therefore adhered in the main to Dr. Gray's arrangement.

The *Pholades* are monographed by Sowerby, Thes. Conch., ii. 1849. Chenu, Ill. Conchyl.; and Hanley, Desc. Cat., besides which, scattered descriptions are contained in the works of numerous ancient and modern authors.

For very full and satisfactory anatomical descriptions of the animals of PHOLADIDÆ, see

Poli. Testacea utriusque Siciliae.

Deshayes. Exploration Scientifique de l'Algerie. Mollusques.

Fischer. Journal de Conch. 2d ser., vols. iii. and iv.

The *Pholades* inhabit all parts of the world, and many of the species have a geographical range much surpassing that of the generality of bivalve mollusca; and the supporters of the theory of the specific distinctness of all

* An Attempt to Arrange the Species of PHOLADIDÆ into Natural Groups, by J. E. Gray, Ann. and Mag. Nat. Hist., 2d ser., viii. p. 380, 1851.

the Mollusca of the Pacific coast of America from that of the Atlantic, must admit that in this family, at least, no such barrier exists. This wide distribution has doubtless been caused, in a great degree, by the circumstances of habitation of several of the species, which seem to select floating timber for their abode. In these habitations they appear to sustain those vicissitudes of temperature which so generally circumscribe the Marine Testacea, except deep-sea species, to restricted zones of latitude; but it is exceedingly surprising that the larger species, which naturally make their abode in stone or mud, do not appear to be any more restricted in habitat than the others. In illustration of this subject, the following species and their range are cited:

Pholas costata, L. New Bedford, Mass. Mexico. Mediterranean.

Pholas truncata, Say. Atlantic coast from Nova Scotia to Florida. Peru. Chili.

Zirphæa crispata, L. Europe. United States. West coast (teste Carpenter.)

Martesia striata, L. Europe. West Indies. Philippine Islands.

The manner in which the animals of *Pholas* excavate the holes in rocks, wood and hard clay, in which they reside, has long proved a puzzling question to naturalists, and various theories have been started in explanation. The hypothesis of the evolution of an acid or solvent to eat away the surface of limestone rocks, was met with the powerful objection that the delicate valves of the animal itself would be equally liable to attack, and when it was found that the *Pholas*, not restricting its operations to carbonate of lime, excavated with equal facility surfaces on which acid has no effect,—gneiss, for instance,—the "solvent theory" received its death-blow. The use of the valves with their sharp imbrications in effecting the work of excavation is forbidden by their frequently perfect state, even when contained in the hardest substances;—(exemplified by a piece of extremely hard gneissic rock from the coast of France, containing a magnificent specimen of *Dactylina dactylus*, with its imbricated ribs sharp and perfect. Coll. Acad. Nat. Sci.)

The anterior part of the animal of *Pholas* has a granulated surface, caused by the presence of numerous siliceous particles; and this is probably the instrument which the animal employs in its work. Recent investigations have shown that these granules are renewed as fast as they are worn off by attrition with the surrounding surface, thus forming an analogy with the tongue of the Gasteropoda. The young shells of *Pholadidæ* frequently differ much from the adult, and this difference has caused the description of many of these as distinct species; the synonymy of the family is further confused by the redescription of species procured from stations far distant from the original localities.

Dr. Gray includes in the family *Pholadidæ*, three subfamilies, which are thus characterized:—

1. *PHOLADINÆ*. Dorsal muscle attached by one or two dorsal shelly valves. Cavity in which the animal lives not lined with a regular shelly tube enclosing the valves.

2. *ZIRPHÆINA*. Dorsal muscles only covered with a horny or coriaceous epidermis. The cavity in which they live not lined with a regular shelly tube enclosing the valves.

3. *TEREDININA*. Dorsal muscles covered with a coriaceous epidermis. Cavity in which they live lined with a regular shelly tube surrounding the valves.

The great differences between *Pholas* and *Teredo* (strengthened by Dr. Gray's recent discoveries respecting *T. giganteus*) have induced me to separate them into distinct families, one containing two, the other three subfamilies, as follows.

[April,

Order *PHOLADACEA*.Family *PHOLADIDÆ*.

Animal clavate, with a large truncated foot protruded through the otherwise closed mantle; siphons elongated, connected nearly to their ends, and not provided with shelly styles. Gills narrow, attached, closing the branchial chamber; palpi elongate.

Shell always present, its valves generally protected by one or more accessory dorsal plates.

Inhabiting excavations in wood or stone, the walls of which are sometimes, but not frequently, lined with a testaceous deposit.

Subfamily 1. *PHOLADINÆ*. The valves with a gap anteriorly, which is never closed in the adult shell.

Subfamily 2. *JOVANNETINÆ*. Anterior ventral hiatus open in the young shell, but invariably closed in the adult by a callous plate.

Family *TEREDIDÆ*.

Animal elongate, subcylindrical, siphons united nearly to the end, their extremities armed with two shelly styles; foot long and narrow, protruded through the united mantle lobes, which are thickened in front. Gills long; mouth with palpi. Shell, when present, globular, tripartite, included with the animal in a more or less cylindrical testaceous tube, the siphonal end of which is divided into two by a longitudinal partition.

Subfamily 1. *TEREDINÆ*. Valves present, free, contained in the tube, which is irregularly cylindrical, sometimes much contorted. Perforating timber.

Subfamily 2. *TEREDININÆ*. Valves with an accessory anterior dorsal plate; their margins prolonged into a shelly tube when adult. Tube frequently concamerated; siphonal extremity often truncate, and the opening contracted by a six-lobed internal margin, (*fossil*.)

Subfamily 3. *KUPHINÆ*. Without valves. Tube clavately cylindrical, sunk horizontally in sand. Never penetrating timber.

The present paper will comprise the family *Pholadidæ* as here limited, while *Teredidæ* will form the subject of a future article.

*Synopsis of Genera.*Subfamily *PHOLADINÆ*.

Anterior hiatus always open.

* *With two dorsal accessory valves.*

Dorsal valves placed anterior and posterior to the beaks, the anterior lanceolate, the posterior small, transverse. Umbonal processes reflected over the beaks, closely applied. Shell elongate Genus *PHOLAS*, Linn.

Dorsal valves lanceolate, placed side by side. Umbonal processes reflexed over the beaks, cellular beneath. Shell oblong, ovate Genus *DACTYLINA*, Gray.

Dorsal valves half ovate, diverging, small. Umbonal processes none, but the anterior margins of the valves reflexed. Shell globose Genus *XYLOPHAGA*, Turton.

Dorsal valves moderate, diverging; anterior hiatus small. Shell oblong-ovate, with a pair of siphonal valves at their posterior end Genus *TALONA*, Gray.

1862.]

** *With a single accessory valve.*

Dorsal valve lanceolate; umbonal processes reflexed, closely applied. Shell oblong-ovate.....Genus *BARNEA*, Leach.

Dorsal valve ovate-cuneiform; umbonal processes reflexed, cellular beneath. Shell oblong-ovate.....Genus *MONOTHYRA*, Tryon.

Dorsal valve small, transverse, posterior, under a coriaceous epidermis. Hinge plates produced and reflexed. Shell ovate.....Genus *NAVYA*, Gray.

*** *Destitute of accessory valves.*

Beaks protected by a membrane. Valves ovate...Genus *ZIRPHEA*, Leach.

Subfamily *JOUANNETINÆ*.

Anterior ventral gap closed in the adult by a callous plate.

* *With three dorsal accessory valves.*

Anterior dorsal plates two, placed side by side, posterior to which is a central plate, directly over the umbones. Base of the siphons protected by reflected appendages.....Genus *PENIPHELLA*, Valenciennes.

** *With two dorsal accessory valves.*

Dorsal valves small. The base of the siphons protected in the adult by a subtestaceous cup-shaped appendage, which is absent in young individuals. Valves ovate.....Genus *PHOLADIDEA*, Turton.

Surface impressed by two oblique sulci, extending from the beaks to the margins. Shell ovate-oblong. Valves equal.....Genus *PARAPHOLAS*, Conrad.

*** *With a single accessory valve.*

Shell globose, hinge plates not reflexed; inequivalve, the left valve overlapping the right.....Genus *JOUANNETIA*, Desmoulins.

Shell ovate-oblong, accessory valve lanceolate or peltate. Equivalve; the surface impressed by one or more furrows.....Genus *MARTESIA*, Leach.

Index to the species of PHOLADIDÆ.

<i>Anchomasa Pennantiana</i> , Leach = <i>Barnea parva</i> , Penn.	<i>Dactylina candeana</i> , D'Orb. = <i>D. Campechensis</i> .
<i>Barnea Australasica</i> , Gray.	" <i>Chiloensis</i> , King.
" <i>Bakeri</i> , Desh. = <i>B. Burmanica</i> ?	" <i>dactylus</i> , Linn.
" <i>Burmanica</i> , Philippi.	" <i>orientalis</i> , Gmel. = <i>Monothyra orientalis</i> , Gm.
" <i>candida</i> , Linn.	<i>Jouannetia Cumingii</i> , Sowb.
" <i>Erythraea</i> , Gray.	" <i>Darwini</i> , Sowb. = <i>Penitella penita</i> .
" <i>fragilis</i> , Sowb. = <i>Manillensis</i> , Philippi.	" <i>globosa</i> , Quoy.
" <i>lanceolata</i> , D'Orb.	" <i>globulosa</i> , Quoy = <i>J. globosa</i> .
" <i>Manillensis</i> , Philippi.	" <i>pectinata</i> , Conrad.
" <i>parva</i> , Pennant.	" <i>pulcherrima</i> , Sowb. = <i>J. pectinata</i> .
" <i>similis</i> , Gray.	<i>Martesia acuminata</i> , Sowb. = <i>M. calva</i> .
" <i>subtruncata</i> , Sowb.	" <i>aperta</i> , Sowb.
<i>Cadmusia Solandertiana</i> , Leach = <i>Pholadidea papyracea</i> , Soland.	" <i>Australis</i> , Gray.
<i>Dactylina Campechensis</i> , Gmel.	" <i>branchiata</i> , Gould.
" " Gray, = <i>D. Chiloensis</i> (part.)	" <i>Californica</i> , Conr. = <i>Parapholas Californica</i> .

[April,

- Martesia calva*, Sowb.
 " *clavata*, Lam. = *M. striata*.
 " *corticaria*, Adams.
 " *cuneiformis*, Say.
 " *curta*, Sowb.
 " *intercalata*, Carpenter.
 " *multistriata*, Sowb.
 " *obtecta*, Sowb.
 " *ovum*, Gray.
 " *rivicola*, Sowb.
 " *striata*, Linn.
Monothya orientalis, Gmelin.
Mya crispata, Linn. = *Zirphæa crispata*.
Navea nucifera, Fabr.
 " *subglobosa*, Gray.
 " *tenuis*, Gray.
Parapholas acuminata, Sowb. = *Martesia calva*.
 " *bisulcata*, Conr. = *Martesia calva*.
 " *Californica*, Conrad.
 " *calva*, Sow. = *Martesia calva*.
 " *concamerata*, Desh. = *Penitella penita*.
 " *Janelli*, Desh. = *P. Californica*.
 " *ovoidea*, Gld. = *Pholadidea ovoidea*.
 " *penita*, Conr. = *Penitella penita*.
 " *quadrizonalis*, Spengl.
Penitella Conradi, Val. = *P. penita*.
 " *penita*, Conrad.
 " *Wilsonii*, Conr. = *Pholadidea melanura*.
Pholadidea cuneiformis, Say = *Martesia cuneiformis*.
 " *curta*, Sow. = *Martesia curta*.
 " *Goodallii*, Blain. = *P. papyracea*.
 " *loscombii*, Turt. = *P. papyracea*.
 " *melanura*, Sowb.
 " *ovoidea*, Gould.
 " *papyracea*, Solander.
 " *penita*, Conr. = *Penitella penita*.
 " *quadra*, Sowb.
 " *spatulata*, Sowb.
 " *sulcata*, Brown.
 " *tridens*, Gray.
 " *tubifera*, Sowb.
Pholadopsis pectinata, Conr. = *Jouannea pectinata*.
Pholas acuminata, Sowerb. = *Martesia calva*.
 " *angustus*, Petiver. = *Dactylina dactylus*.
Pholas antipodum, Phil. = *Barnea similis*.
 " *aperta*, Sowb. = *Martesia aperta*.
 " *Australasiae*, Gray, = *Barnea Australasiae*.
 " *Bakeri*, Desh. = *Barnea Burmanica*?
 " *Beauviana*, Recluz. = *Mart. corticaria*, Ad.
 " *bifrons*, Da Costa, = *Zirphæa crispata*.
 " *Birmanica*, Phil. = *Barnea Burmanica*.
 " *branchiata*, Gould. = *Martesia branchiata*.
 " *Californica*, Conr. = *Parapholas Californica*.
 " *callosa*, Lam. = *Dactylina dactylus*.
 " *calva*, Sowb. = *Martesia calva*.
 " *Campechensis*, Gmel. = *Dactylina Campechensis*.
 " *Candeana*, D'Orb. = *Dactylina Campechensis*.
 " *candida*, Chemn. = *Talona explanata*.
 " *candida*, Linn. = *Barnea candida*.
 " *Caribæa*, D'Orb. = *Martesia corticaria*.
 " *Chiloensis*, King, = *Dactylina Chiloensis*.
 " *clausus*, Gray, = *Talona explanata*.
 " *clavata*, Lam. = *Martesia striata*.
 " *concamerata*, Desh. = *Penitella penita*.
 " *conoides*, Flem. = *Mart. striata*.
 " *constricta*, Sowb. = *Zirphæa constricta*.
 " *cordata*, Schröter, = *Schröteria cordata*.
 " *cornea*, Sowb. = *Penitella penita*.
 " *corticaria*, Ad. = *Martesia corticaria*.
 " *costata*, Linn.
 " *crenulatus*, Spengler, = *Barnea parva*.
 " *crispa*, Blainv. = *Zirphæa crispata*.
 " *crispata*, Linn. = *Zirphæa crispata*.
 " *crucifera*, Sowb.
 " *cruciger*, Sowb. = *P. crucifera*.
 " *cucullata*, Gray, = *Penitella penita*.
 " *cuneiformis*, Say, = *Martesia cuneiformis*.
 " *curta*, Sowb. = *Martesia curta*.

- Pholas *dactyloides*, Della Chiaje, = Barnea candida.
- " *dactyloides*, Lamarck, = Barnea parva.
- " *dactylus*, Linn. = Dactylina dactylus.
- " *dactylus*, Spengl. = Monothyras orientalis.
- " *dactylus*, var. Deshayes, = Barnea parva.
- " *Darwinii*, Sowb. = Penitella penita.
- " *Edwardii*, Gray, = Martesia cuneiformis.
- " *explanata*, Spengl. = Talona explanata.
- " *falcata*, Wood, = Martesia striata.
- " *fragilis*, Sowb. = Barnea Manillensis.
- " *gibbosa*, D'Orb. = Xylophaga globosa.
- " *globulosa*, Quoy, = Jouannetia globosa.
- " *hians*, Pultney, = Dactylina dactylus.
- " *Hornbeckii*, D'Orb. = Martesia corticaria.
- " *Incii*, Sowb. = Parapholas quadrizonalis.
- " *Janelli*, Desh. = Parapholas Californica.
- " *Julan*, Adans. = Zirphæa Julian.
- " *lamellata*, Turt. = Pholadidea papyracea.
- " *lamellosa*, D'Orb. = Barnea subtruncata.
- " *lanceolata*, D'Orb. = Barnea lanceolata.
- " *laqueata*, Sowerby, = Dactylina Chiloensis.
- " *latissima*, Sowb.
- " *ligamentina*, Deshayes, = Barnea parva.
- " *lignorum*, Spengler, = Martesia striata.
- " *Manillæ*, Sowb. = Barnea Manillensis.
- " *Manillensis*, Phil. = Barnea Manillensis.
- " *melanura*, Sowb. = Pholadidea melanura.
- " *multistriata*, Sowb. = Martesia multistriata.
- " *muricata*, Da Costa, = Dactylina dactylus.
- " *nana*, Pult. = Martesia striata.
- " *nucifera*, Fab. = Navea nucifera.
- Pholas *oblongata*, Say, = Dactylina Campechensis.
- " *obtecta*, Sowb. = Martesia obtectata.
- " *orientalis*, Gmel. = Monothyras orientalis.
- " *ovata*, Gray, = Martesia ovum.
- " *ovoidea*, Gould, = Pholadidea ovoidea.
- " *ovum*, Gray, = Martesia ovum.
- " *papyracea*, Spengler. = Barnea candida.
- " *papyracea*, Soland. = Pholadidea papyracea.
- " *parva*, Pennant, = Barnea parva.
- " *parva*, Da Costa, = Zirphæa crispata.
- " *patula*, Gould, = P. latissima.
- " *penita*, Conr. = Penitella penita.
- " *pusilla*, Linn. = Martesia striata.
- " *quadra*, Sowb. = Pholadidea quadra.
- " *quadrizonalis*, Spengl. = Parapholas quadrizonalis.
- " *rivicola*, Sowb. = Martesia rivicola.
- " *rudis*, Gray, = Martesia cuneiformis.
- " *semicostata*, H. C. Lea, = Martesia striata.
- " *Siamensis*, Spengl. = Monothyras orientalis.
- " *silicula*, Desh. = Barnea candida.
- " *similis*, Gray, = Barnea similis.
- " *spathulata*, Sowb. = Pholadidea spathulata.
- " *striata*, Linn. = Martesia striata.
- " *striata*, Blainv. = Pholadidea papyracea.
- " *subtruncata*, Sowerby = Barnea subtruncata.
- " *sulcata*, Brown, = Pholadidea sulcata.
- " *Terediniformis*, Sowb. = Martesia striata.
- " *tridens*, Gray, = Pholadidea tridens.
- " *truncata*, Say.
- " *tuberculatus*, Turton, = Barnea parva.
- " *tubifera*, Sowb. = Pholadidea tubifera.
- " *Vibonensis*, Phil. = Pholadidea papyracea.
- " *Xylophaga*, Desh. = Xylophaga dorsalis.
- Schröteria cordata, Schröter.
- Solen crispus*, Gmel. = Zirphæa crispata.

[April,

<i>Talona clausa</i> , Gray, = <i>T. explanata</i> .	<i>Xylophaga cardissa</i> , Gould.
" <i>explanata</i> , Spengler.	" <i>dorsalis</i> , Turton.
<i>Teredo dorsalis</i> , Turton. = <i>Xylophaga</i>	" <i>globosa</i> , Sowb.
<i>dorsalis</i> .	<i>Zirphæa Beauviana</i> , Recluz. = <i>Martesia</i>
<i>Thurlosia crispata</i> , Leach. = <i>Zirphæa</i>	<i>corticaria</i> .
<i>crispata</i> .	" <i>constricta</i> , Sowb.
<i>Triumphalia Cumingii</i> , Sowb. = <i>Jouan-</i>	" <i>crispata</i> , Linn.
<i>netia Cumingii</i> .	" <i>Darwini</i> , Sowb. = <i>Penitella</i>
" <i>globosa</i> , Quoy, = <i>Jouanne-</i>	<i>penita</i> .
<i>tia globosa</i> .	" <i>Julan</i> , Adanson.
" <i>pulcherrima</i> , Sowb. = <i>Jou-</i>	" <i>Vibonensis</i> , Philippi, = <i>Phola-</i>
<i>annetia pectinata</i> .	<i>idea papyracea</i> .

Reference to Authors on *Pholadidæ*.

- Adams, Chas. B. Catalogue of Shells Collected at Panama, 1852. Contributions to Conchology, 1849 to 1852.
- Adams, H. & A. Genera of Recent Mollusca, ii. 1854.
- Adams & Reeve. Mollusca; Voyage of the Samarang, 1850.
- Adanson. Hist. Nat. du Senegal, 1757.
- Alder. Catalogue of the Mollusca of Northumberland.
- Aldrovandi. De Test, 1618.
- Anton. Versuch der Conchylien, 1839.
- Argenville. Conchyliologie, 1757.
- Aucapitaine. Observ. sur la perforation des Roches par les Pholades, Rev. et Mag. Zool., 1851.
- Barbut. Genera Vermium.
- Beau. Catalogue des Coquilles Guadeloupe, 1858.
- Below. De Aquat.
- Blainville. Dict. des Sciences Naturelles, xxxvii. xxxix. 1826. Manuel Malcologie, 1825.
- Bonanni. Recreatio Mentis et Oculi, pt. 2, 1684.
- Born. Test. Musei Cæsarei Vindobonensis, 1780.
- Bosc. Hist. Nat. des Coquilles, ii. 1801.
- Boucharde-Canteraux. Cat. Coquilles Boulonnais, 1829.
- Breynius. Dissert, 1732.
- Bronn. Syst. urw. Conchyl., 1824.
- Booke, Samuel. Conchology, 1815.
- Brown, Capt. Thos. Illustrations of the Conchology of Great Britain, 1844.
- Bruguier. Encyclopedie Methodique, 1789.
- Burrow. Elements, 2d edit., 1825.
- Cailliaud, F. Perforation des Pholades, Rev. et Mag. Zool., 1851, p. 543; 1857, p. 64.
- Carpenter, P. P. Report on the Mollusca of the West Coast of North America, 1856. In Zoological Proceedings, 1856, Catalogue of Reigen Collection of Mazatlan Mollusca, 1857. Check-List of West Coast Mollusca, 1860. Lectures on Mollusca, 8vo, 1861.
- Catlow, Agnes. Conchologists' Nomenclator, 1845.
- Chemnitz. Conchylien Cabinet, viii. 1785.
- Chenu, J. C. Illustrations Conchyliologiques Monog, Pholas, folio. Encyc. Hist. Nat. Mollusques. Manuel de Conchyliologie, ii. 1862.
- Collard des Cheres. Cat. Moll. du Dep't du Finisterre, 1830.
- Conrad, T. A. Proc. Acad. Nat. Sciences, Dec., 1848 and Feb., 1849. Journ. Acad. Nat. Sciences, 1st series, vii. 1837; 2d series, i. 214, 1849; 279, 1850; ii. p. 335, 1854.
- Crouch. Introduction to Lamarck's Conchology, 1827.

1862.]

- Cuvier.....Tabl. Method., 1798. Anat. Comparit. 1800. *Regne Animal*, 1st edit., 1817; edit. Croch; edit. Griffith, 1834; edit. Henderson; edit. Audouin, 1836.
- Da Costa.....British Conchology, 1778.
- De Kay, J. E.....Mollusca of New York, 1843.
- Delessert.....Rec. des Coq. decrites par Lamarck, 1841.
- Della Chiaje.....Mem., iv.
- Deshayes.....Exploration Scientifique de l'Algerie, Mollusques. *Encyc. Method. Vers.*, iii. 1830. *Traité Elem.*, i. pt. 2, 1843-'50. In Lamarck, vi. 1835. *Annals des Sciences Naturelles*, 2 ser., xi. p. 240. *Review Zoologique*, 1839. *Guerin's Mag. Zool.*, 1840.
- Desmoulins, Chas... ..Bull. Linn. Soc. Bordeaux, ii.
- Dillwyn, L. W.....Descriptive Catalogue of Recent Shells, 1817.
- Donovan.....British Shells, iv. 1799.
- D'Orbigny, Alcide.....Mollusca of Sagra's Hist. Cuba, ii. *Voy. Amer. Merid. Mollusques*.*
- Favanne.....Conchyliologie, 1780.
- Ferussac.....Tabl. Systematique, 1821.
- Fischer.....Journ. de Conchyliologie, 2d ser., iii. 1858 and iv. 1860.
- Fleming.....History of British Animals, 1828. *Edinburg Encyclopedia*, viii.
- Forbes and Hanley.....History of British Mollusca, i. 1853.
- Gay.....Hist. Nat. Chili, viii.
- Gerville.....Cat. Coquilles de la Manche, 1825.
- Gesner.....De Crust.
- Gibbes.....In Tuomey's Geol. S. Carolina, 1848.
- Ginanni.....Op. Post., 1755-'57.
- Gmelin.....Systema Naturæ, 1790.
- Gould, A. A.....In Boston Proceedings, ii. 1845. In Boston Journal, vi. 1853. *Invertebrata of Massachusetts*, 1841. *Mollusca Wilkes' Exploring Expedition*, 1852. *Otia Conchologica*, Feb., 1862.
- Gray, J. E.....Mollusca; Yates' New Zealand. In Bowdich's Elements, 1822. Figures of Molluscous Animals, v. 1857. In London Medical Repository, 1821. *Synopsis Brit. Mus.*, 1820; 1839; 1840; 1842. *Proc. Zool. Soc.*, 1847. In *Annals and Mag. Nat. Hist.*, 2d ser., viii. p. 380, 1851.
- Gualtieri.....Index Testarum, 1742.
- Hanley.....Descriptive Catalogue, 1842.
- Hermannson.....Genera, 1849.
- Jay, J. C.....Catalogue of Shells, 4th edit., 1850.
- Johnston.....De Exang.
- Karsten.....Mus. Lesk, i. p. 150.
- King.....Zool. Journal, v. 1832.
- Klein.....Ostracologicæ, 1757.
- Knorr.....Vergnügen der Augen, ii. 1757.
- Kurtz.....Catalogue of Mollusca of North and South Carolina, 1860.
- Lamarck.....Prodr., 1799. *Phil. Zool.*, 1809. *Extrait d'un Cours*, 1812. *Anim. Sans. Vert.*, v. 1818; (edit. Desh.,) vi. 1835; (edit. Brux.,) ii.
- Latreille.....Fam. Nat., 1825.

* The title-page of this volume bears date 1835-'43, yet reference is made in the text to descriptions published by other authors in 1846.

- Lea, Henry C. Proc. Amer. Phil. Soc., iii. 1843. Boston Recr., 1844.
 Leach, W. E. Mollusca of Great Britain, 1852.
 Linnaeus..... Mus. Ulric. Faun. Suec. West. Res., 1747. Systema
 Naturæ, ed. 10, 1758.
 Lister..... Hist. Conchyliorum, 1687. Anim. Angl., 1678.
 Macgillivray, Wm. Molluscous Animals of Aberdeen, 1843.
 Marrye..... Meth. Necess. aux Marins.
 Mawe..... Conchology, 1823.
 Menke..... Syn. Methodique, 1820, 2d edit., 1830.
 Middendorff. Malacozoologica Rossica, pt. iii. 1849.
 Milne-Edwards Conch., 1845.
 Montagu..... Testacea Britannica, 1803.
 Morch Catalogue, 1853.
 Müller Fauna Danica, 1788.
 Müller, Theo Synopsis Test. Viv., 1836.
 Murray Fund. Testaceologie.
 Olivi..... Zool. Adriatica, 1792.
 Olafsen..... Island, 1722.
 Pennant..... Brit. Zoology, iv. 1777.
 Petiver Gazophyllum.
 Phillipi..... Neüer oder Wenig. Gekannte Conchylien, iii. 1847—'51.
 Enum. Moll. Sicil., i. 1836; ii. 1844. Zeitschr für
 Malak., 1847.
 Pliny Hist. Nat., ix.
 Plancus..... De Conch.
 Poiret..... Voy. en Barbarie, pt. 2.
 Poli..... Testacea utriusque Siciliae, i. 1791; ii. 1795.
 Potiez et Michaud. Gallerie des Mollusques, ii. 1844.
 Pultney Dorsetshire Catalogue, 1799.
 Quoy..... Mollusca, Voy. Astrolabe, 1832.
 Rang..... Manuel Mollusques, 1829.
 Reaumur..... Mem. de l'Acad., 1812.
 Reeve..... Conch. Syst., 1841.
 Recluz..... Journal de Conchyliologie, 1st ser., iv. 1853.
 Reichenbach..... Conchylien, 1842.
 Risso..... Hist. Nat. Europe Meridionale, iv. 1826.
 Roissy Mollusques, 1805.
 Rondelet..... Hist. des Poissons.
 Rumphius..... Amboinsche Rareitetskamer, 1705.
 Russell..... Essex (Mass.) Journ. Nat. Hist., i. 1839.
 Say, Thos..... Journal Acad. Nat. Sciences, 1st ser., ii. 1822.
 Schröter..... Einleit in Conchylien, iii. 1786.
 Schumacher.. . Essai d'un Nov. Syst., 1817.
 Seba..... Mus., iii. 1761.
 Sowerby..... Conchological Manual, 1842. Monog. Pholas. Thes.
 Conch., ii. 1849. Genera, No. 23, 1820—'24. Zoo-
 logical Proc., 1834; 1835; 1849. Illustrations of
 Brit. Shells, 1859.
 Spengler..... Besch. Berl. Naturg., iv. Skrivt. Nat., ii. pt. 1, 1792;
 iv. 1798.
 Stimpson, Wm..... Shells of New England, 1851. Check-List East Coast
 Shells, 1860.
 Swainson..... Elements, 1835. Treatise on Malacology, 1840.
 Thompson..... Report on Irish Fauna.
 Thorpe, Chas..... British Marine Conchology, 1844.
 Turton..... Conchological Dictionary, 1819. Conch dithyra Britanica,
 1822.
- 1862.]

Valenciennes.....Atlas, Mollusca, Voyage of the Venus, 1846.
Wheatley, C. M.....Catalogue of the Shells of the United States, 1842.
Wood, Wm.General Conchology, 1817; 2d edit., with plates, 1835.
 Index Testaceologicus, 1818; 2d edit., with plates,
 1828.
Woodward, S. P.Manual of Mollusca, part 2, 1854.
Wyatt, Thos.Conchology, 1838.

List of recent species.

Family *PHOLADIDÆ*, Carpenter.

PHOLADIDÆ, P. P. Carpenter, Lectures on Mollusca, p. 99, 1861.

Pholadidæ, (part.) Gray, 1839. Gray Zool. Proc. p. 187. 1847. Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 380, 1851.

“ “ H. C. Lea, Proc. Am. Phil. Soc. iii. p. 163, 1843. Woodward, Man. pt. 2, 1854.

Adesmacea, (part.) Blainville, Malacol. p. 577, 1825.

Cladopoda, (part.) Gray, London Med. Repository, 1821.

Pholadacea, (part.) Blainville, 1818.

Pholadæ, (part.) Fleming, Hist. Brit. Anim. p. 410, 1828. Gray, Syn. Brit. Mus. p. 91, 1842.

Pholadaria, (part.) Lamarck, Phil. Zool. 1809, Extr. d'un Cours. 1812, Anim. S. Vert. v. p. 441. Sowerby, Manual p. 224, 1842. Hanley, Desc. Cat. p. 5, 1842.

Pholadariaæ, (part.) Latr. Fam. Nat. 1825.

Pholadea, (part.) Anton. Versuch, p. 1, 1839. Menke, Syn. p. 121, 1830.

Pholadææ, (part.) Menke, Syn. p. 73, 1828.

Pholades, (part.) Ferussac, Tab. Syst. 1821.

Pholadiadæ, (part.) Leach, teste Gray.

Pholadina, (part.) Milne-Edwards, Conch. p. 203, 1845.

Pholadoideæ, (part.) Agassiz, Nomenc. Zool. 1847.

Pholadria, (part.) Sism., Syn. An. Foss. 1842.

Pholedariaæ, (part.) Bronn, Syst. urw. Conch. 1824.

Pholidæ, (part.) Swainson, Elem. 1835. Swainson, Malacol. 1840.

Pholidææ, (part.) Leach, teste Swainson, Malacol. 1840.

Subfamily PHOLADINÆ, Tryon.

Pholadina, (part.) Gray, Zool. Proc. p. 187, 1847. Ann. and Mag. Nat. Hist. 2d ser. viii. p. 380, 1851.
Zirphæina, (part.) Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 381, 1851.

Genus PHOLAS, Linn.

Pholas, Linnæus, Syst. Nat. 1757. Langius, 1722. Adanson, Senegal, 1757. Brug., Encyc. Meth. 1789. Gmelin, Syst. Nat. 1790. Olivi, Adrit 1792. Spengler, Skrivt. ii. 1792. Cuvier, Tabl. Meth. 1798. Lamarck, Prodr. 1799. Cuvier, Anat. Comp. 1800. Lamarck, Syst. 1801. Schumacher, Essai d'un Nov. Syst. 1817. Cuvier, Regne Anim. 1817. Ferussac, Tabl. Syst. 1821. Fleming, Brit. Anim. 1828. Rang. Man. 1829. Swainson, Malacol. 1840. Reeve, Conch. Syst. 1841. Hermannsson, Genera, 1849. Sowerby, Monogr. 1849. Gray, Ann. Mag. N. Hist. 1851. Woodward, Man. 1854. H. & A. Adams, Genera ii. 1854. Chenu, Man. ii. 1862.

Pholas, (part.) Lister, Hist. 1687.*

Dactylus, (Pliny, Hist. Nat. ix. Cap. 87.

* The Genus *Pholas* of Rondelet, Univ. Aq. Hist. 1855; Aldrovandi, Des Test. 1606; Reaumur, Mem. Acad. Roy. 1712; Tournef. 1742; D'Argenville, Conch, 1757; and (part.) Lister, Hist. 1687 = *LITHODOMUS*.

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- Conchoides*, (part.) Breyn., Dissert. p. 8, 1732. Gualtieri, Ind. tab. 105, 1742.
Solen, (part.) Tournefort, in Gualtieri Index, 1742.
Mya (part.) Linn., Westg. Res. p. 187, 1747. Syst. Nat. (ed. 10) p. 670, 1758.
Chamaepholas, (part.) Browne.
Concha-Eboracensis, Klein, Ostracol. p. 170, 1753.
Hypogæa, (part.) Poli, Test. utr. Sicil. i. p. 29, 1791.
Hypogæoderma, (part.) Poli, Test. utr. Sicil. ii. p. 251, 1795.

There are but four known recent species of *Pholas* as now restricted, and they are very easily distinguishable from each other.

*Margins of the valves regularly rounded anteriorly.....*P. costata*.

**Anterior ventral margins emarginate.....Subgenus *CYRTOPLEURA*.

a. Posterior extremity of the shell not truncate.....*P. crucifera*.

b. Posterior extremity truncate.

Truncated end but very slightly convex in outline.....*P. truncata*.

Truncated end rounded, shell short and broad.....*P. latissima*.

- P. costata*, Linn., Linnæus, Syst. Nat. 1111. Adans., Genera iii. t. 89, f. 1, 1, a. Anton. Verzeich der Conch. p. 1. Blainville, Man. de Malacol. t. 79, f. 6. Born., Testacea, p. 15. Bosc. Hist. Nat. des Coq. ii. p. 195. Brug. Encyc. Meth. t. 169, f. 1, 2. Catlow., Conch. Nomenc. p. 3. Chemnitz, Conchyl. Cab. viii. t. 101, f. 863. Chenu, Man. de Conch. ii. f. 1, 2, 3. Deshayes, Encyc. vers. iii. p. 754. Deshayes, Traite Elem. i. pt. ii. t. 3, f. 10. Dekay, Mollusca New York, p. 248. Dillwyn, Desc. Cat. p. 36. D'Orbigny, Voy. Amer. Merid. Mollusques, p. 496. D'Orbigny, Mollusques, Sagra's Cuba, ii. p. 213. Favanne, Conchyl. t. 60, f. 1. Fischer, Journ. Conchyl. 2d ser. iii. p. 48. Gibbes, in Tuomey's Geol. S. Carolina. Gmelin, Syst. Nat. p. 3215. Gould, Invert. Mass. p. 27. Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 381. Gualtieri, Index Test. t. 105, fig. g. Hanley, Desc. Cat. p. 6. Jay, Cat. 4th edit. p. 10. Knorr, Vergnüg. ii. t. 25, f. 4. Kurtz, Cat. Shells, N. and S. Carolina, p. 3. Lamarck, Anim. sans Vert. (Desh. Edit.) vi. p. 45. Lister, Conch. t. 434, f. 277. Mawe., Conch. t. 1, f. 4. Menke, Syn. p. 73. Mörch. Cat. p. 3. Potiez and Mich., Gallerie des Moll. ii. p. 269. Reeve, Conch. Syst. t. 23. Schröter, Einleit. Conch. iii. p. 537. Sowerby, Genera No. 23. Sowerby, Monog. *Pholas*. Thes. Conch. ii. p. 487, t. 102, f. 8, 9. Spengler, Skrivt. Nat. ii. p. 86. Stimpson, Shells New England, p. 25. Stimpson, Check List E, Coast Shells, No. 243. Wheatley, Cat. Shells. U. S. p. 2. Wood, Gen. Conch. t. 15, f. 1, 2. Wood, Index Test. t. 2, f. 4. Wyatt, Conch. p. 28, t. 3, f. 4.

Coll. Acad. Nat. Sci., from Georgia, Cuba, Vera Cruz. Coll. Dr. J. C. Jay. Coll. G. W. Tryon, Jr., (from Atlantic City, N. J.) Coll. Isaac Lea, LL.D.

Dr. Gould included this species in his "Invertebrata," on account of the discovery by Prof. C. B. Adams of an extensive bed of dead shells in New Bedford harbor. He subsequently announced it as living at this locality, remarking that he was not aware of its existence at any other place north of the Mexican Gulf. (Bost. Proc. ii. p. 81, 1845.)

Dr. De Kay described *P. costata* as a Southern shell, and no account of its occurrence north of North Carolina has been noticed, except "New York," in Jay's Catalogue. Dr. Stimpson writes to me that he has never met with this shell at any intermediate locality; therefore I am glad to announce its occurrence at Atlantic City, New Jersey, where I obtained several perfect valves on the beach, and at Cape May, New Jersey, where Dr. Leidy has procured a few specimens.

Subgenus *CYRTOPLEURA*, Tryon.

Margins of the valves emarginate anteriorly, making a short wide hiatus.

P. crucifera, Sowerby.

1862.]

Pholas cruciger, Sowerby, Zool. Proc. p. 69, 1834. Catlow, Conch. Nomenc. p. 3. D'Orbigny, Voy. Amer. Merid. Moll. p. 499. Müller, Syn. Test. Viv. p. 236.

" *crucigera*, Philippi, Neuer Mollusken, iii. Pholas. t. 2, f. 4.

" *crucifera*, Adams, Panama Shells, p. 301. Adams, Genera, ii. p. 335. Chenu, Man. Conch. ii. f. 5. Fischer, Journ. Conch. 2d ser. iii. p. 48. Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 381. Hanley, Desc. Cat. p. 6. Jay, Cat. 4th ed. p. 10. Sowerby, Monog. Pholas. Thes. Conch. ii. p. 489, t. 104, f. 24—26.

Coll. Acad. Nat. Sci.; St. Croix, West Indies? Panama. Coll. Dr. J. C. Jay. Coll. G. W. Tryon, Jr.

This is a very distinct species, differing from all others in the genus by the cruciform expansion of the dorsal margin.

P. truncata, Say, Journ. Acad. Nat. Sci. 1st ser. ii. p. 321. Adams, Genera, ii. p. 325. Catlow, Conch. Nomenc. p. 4. De Kay, Moll. New York, p. 248, t. 34, f. 223 *a b*. Fischer, Journ. Conch. 2d ser. iii. p. 48. Gibbes, Tuomey's Geol. S. Carolina. Gould, Proc. Bost. ii. p. 81. Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 381. Hanley, Desc. Cat. p. 6, t. 9, f. 56. Jay, Cat. 4th ed. p. 10. Kurtz, Cat. Shells N. and S. Carolina, p. 3. Sowerby, Monog. Pholas, Thes. Conch. ii. p. 488, t. 104, f. 29, 30. Stimpson, Shells New England, p. 25. Stimpson, Check List E. Coast Shells. Wheatley, Cat. Shells U. S. p. 2.

Coll. Acad. Nat. Sci.; New Bedford, Mass., Long Island Sound, S. Carolina, Payta, Peru, Chili. Coll. Dr. J. C. Jay. Coll. Isaac Lea. Coll. G. W. Tryon, Jr.

Mr. Sowerby wrongly refers for Say's description to "American Journal of Science, ii. p. 321."

So late as 1845, Dr. Gould, in announcing to the Boston Society of Natural History the occurrence of this species at New Bedford, Mass., remarked that it was the only locality north of South Carolina; it is now known to inhabit almost the entire coast.

P. truncata grows quite large on the northern coast, reaching three and a half inches, as Dr. Gould informs me, in the vicinity of Sable Island. I had some doubt respecting the locality "Chili" attached to a specimen in Coll. A. N. S. until the recent discovery, amongst a mass of rubbish, of a large bottle of shells, collected by Dr. W. S. W. Ruschenberger at Payta, Peru, which contained a number of specimens of this shell and of *Dactylina Chilensis*. The west coast individuals are about the same size as our Southern specimens, which they also resemble in form, being rather longer and narrower than those from the New England States.

P. latissima, Sowerby.

P. latissima, Sowerby, Proc. Zool. Soc. 1849, p. 162. Sowerby, Monog. Pholas, Thes. Conch. ii. p. 489, t. 103, f. 15, 16. Adams, Genera, ii. p. 325. Chenu, Man. Conchyl. ii. f. 4, 6. Fischer, Journ. Conchyl. 2d ser. iii. p. 48. Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 381. Philippi, Neuer Conch. iii. Pholas, t. 2, f. 1.

P. patula, Gould, Bost. Proc. ii. p. 214, May, 1850. Gould, Moll. U. S. Expl. Exped. p. 384. Adams, Genera, ii. p. 325. Fischer, Journ. Conchyl. 2d ser. iii. p. 48. Jay, Cat. 4th ed. p. 10.

Hab.—Manilla. Philippines.

Coll. Dr. J. C. Jay.

Dr. Gould remarks, in the "Mollusca," that *P. patula* approaches, and may be identical with, Sowerby's species. The descriptions correspond, with the exception of a vertical constriction which divides the valve of *P. patula* in the middle, but which is not mentioned by Mr. Sowerby; nevertheless there is a slight constriction of the valve represented in Mr. Sowerby's figure. There can be no doubt of the identity of these shells.

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Dr. Gould, in his text, refers to fig. 497 *a b*, which was not published, in consequence, as he informs me, of the only valve being broken while in the artist's hands.

P. latissima is readily distinguishable from *truncata* by its posterior side being much shorter, with the edge more rounded, and by the greater thickness of the shell in proportion to its length.

Genus DACTYLINA, Gray.

DACTYLINA, Gray, Proc. Zool. Soc. p. 187, 1847. Gray, Ann. and Mag. Nat. Hist. 2 ser. viii. H. and A. Adams, Genera, ii. p. 325. Chenu, Man. Conch. ii.

Dactylus, Pliny, Hist. Nat. ix. cap. 87.

Pholas, (partim,) of authors.

There are two distinct forms of *Dactylina*; in the first, which I propose to consider the typical form, the nuclei of the dorsal valves are situated at their outer margins, posterior to the centre; several impressed lines radiate from the nuclei to the inner margin, dividing each valve into several subtriangular spaces. The valves are much emarginate anteriorly, forming a short, wide hiatus.

The other form may be thus characterized,—

Subgenus GIROCENTRUM.

Nuclei of the dorsal valves anterior, situated nearer the inner margin. Dorsal plates marked by radiating lines. Valves not emarginate anteriorly, but regularly rounded; hiatus long and narrow.

Typical Species.

D. dactylus, Linn. (species.)

Pholas dactylus, Linn. Syst. Nat. p. 1110. Linnæus, Faun. Suec. 2124. Anton, Verzeich der Conch. p. 1. Argenville, Conchyl. t. 3, f. k. m. Barbut, Gen. Verm. t. 1, f. 11. Bonanni, pt. 2, f. 25, 26. Born, Test. p. 14, t. 1, f. 7. Bosc, Hist. Nat. des Coq. ii. p. 194, t. 5, f. 1, 2, 3. Brooke, Conch. t. 1, f. 7, 8. Brown, Illust. Conch. Great Britain, p. 115, t. 49, f. 1, 2, 3. Bruguière, Encyc. Meth. t. 168, f. 2—4. Catlow, Conch. Nomenc. p. 3. Chemnitz, Conch. Cat. viii. t. 101, f. 857. Chenu, Encyc. Hist. Nat. Moll. t. 33, f. 4, 5. DaCosta, Brit. Conch. p. 144, t. 16, f. 2. Deshayes, Encyc. Vers. iii. p. 753. Deshayes, Expl. Sci. de l'Algerie Moll. p. 107, t. 9, C. E. & G. f. 1—3. (Animal.) Dillwyn, Desc. Cat. i. p. 35. Donovan, Brit. Shells, iv. t. 118. Favanne, Conchyl. t. 60, f. a1. Fleming, Edinburg Encyc. vii. p. 100. Fleming, Brit. Anim. p. 457. Forbes and Hanley, Brit. Moll. i. p. 108, t. 3. Ginnanni, Op. post. t. 31, f. 184, 185. Gmelin, Syst. Nat. p. 3214. Gualtieri, Test. t. 105, f. D. Hanley, Desc. Cat. p. 5. Herbst, Einl. i. p. 115, t. 26, f. 1. Jay, Cat. 4th ed. p. 10. Jonston, De exang. t. 11, f. 8, and t. 13. Karsten, Mus. Lesk. i. p. 150. Lamarck, Anim. sans Vert. v. p. 444. Lamarck, (Desh. edit.) Anim. sans Vert. vi. p. 43. Leach, Moll. Great Britain, p. 251. Lister, Conch. t. 433, f. 276. Marvye, Meth. necess. aux Marins, t. 1, f. 10. Mawe, Conch. t. 3, f. 3. Menke, Syn. Meth. p. 73. Montagu, Test. Brit. p. 20 and 528. Müller, Faun. Dann. p. 251. Murray, Fund. Testac. p. 40, t. 2, f. 3. Olivi, Zool. Adriat. p. 93. Pennant, Brit. Zool. iv. p. 76, t. 39, f. 10. Petiver, Gazoph. t. 79, f. 10. Philippi, Enum. Moll. Sicil. i. p. 3 and ii. p. 4. Plancus, de Conch. p. 33. Poli, Test. utr. Sicil. i. t. 7, f. 1—11. Poirer, Voy. en Barbarie, pt. 2, p. 11. Potiez et Michaud, Galerie des Moll. ii. p. 268. Reaumur, Mem. de l'Acad. 1712, p. 125, t. 7, f. 1, 2. Reeve, Conch. Syst. t. 24. Reichenbach, Conchyl. p. 117, t. 725, 726. Roissy, Moll. vi. p. 438. Seba, Mus. iii. t. 16, f. 6 *a b*. Sowerby,

1862.]

- Genera Pholas, f. 1. Sowerby, Conch. Man. t. 2, f. 55, 55 a. Sowerby, Illust. Brit. Shells, t. 1. f. 8. Sowerby, Monog. Pholas. Thes. Conch. ii. p. 485, t. 102, f. 10, 11 and t. 105, f. 47. Spengler, Skrivt. Nat. ii. pt. 1, p. 85. Thompson, Rep. Irish Fauna, p. 263. Thorpe, Brit. Mar. Conch. p. 31. Wood, Gen. Conch. t. 13, f. 1—3. Wood, Index Test, t. 2, f. 1. Woodward, Manual, p. 328, f. 22. Wyatt, Conch. p. 27, t. 3, f. 3.
- Dactylina dactylus*, Gray, Figs. Moll. Anim. t. 237, f. 4 and t. 238, f. 7. Gray, Ann. and Mag. Nat. Hist. 2 ser. viii. p. 382. H. and A. Adams, Genera, iii. t. 89, f. 2, 2 a b. Chenu, Man. Conch. ii. f. 10, 11, 13. Fischer, Journ. Conchyl. 2 ser. iii. p. 49. Mörch, Cat. p. 3.
- Pholas callosa*, Lamarck, Anim. sans Vert. v. p. 445. Lamarck, (Desh. edit.) Anim. sans Vert. vi. p. 46. Cuvier, Reg. Anim. (edit. Croch.) t. 113, f. 1. Hanley, Desc. Cat. p. 5.
- “ *hians*, Pultney, Dorset. Cat. p. 26.
- “ *angustius*, Petiver, Gazophyl. t. 79, f. 10.
- “ *muricata*, DaCosta, Brit. Conch. p. 244, t. 16, f. 2.
- Donax sive Dactylus*, Belon, de Aquat. p. 414.
- Coquille longue*, Rondelet, Hist. des Poissons, p. 16.
- Concha longa Rondeleti*, Gesner, de Crust. p. 201.
- Concha vera Plinii*, Aldrovandi, de Test. p. 454.
- Concha longa*, Aldrovandi, de Test. p. 455, f. 1. 2, 3.
- Hab.*—Europe.
- Coll. Acad. Nat. Sci. Coll. Isaac Lea, LL.D. Coll. Dr. J. C. Jay. Coll. Geo. W. Tryon, Jr.
- Hanley (Desc. Cat. p. 5) says, “*P. oblongata*, Say, is probably this shell, although its beak and the number of accessory valves is not mentioned.” Say’s shell does not at all resemble *D. dactylus*.
- P. callosa*, Lam., was described from some distorted specimens of *D. dactylus*. I have seen several specimens in Mr. Lea’s cabinet which are greatly distorted in shape, the beaks being almost central, the shell much wider than usual in proportion to its length, the posterior surface worn entirely smooth, and anteriorly deeply pitted, instead of the usual radiating ribs.
- Subgenus *GITOCENTRUM*, Tryon. 1862.
- D. Campechensis*, Gmel. (Species.)
- Pholas Campechensis*, Gmelin, Syst. Nat. 3216. Catlow, Conch. Nomencl. p. 3. Hanley, Desc. Cat. p. 6, t. 9, f. 44. Jay, Cat. 4th ed. p. 10. Lister, Hist. Conch. t. 432.
- Dactylina Campechensis*, (part.) Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 382. H. and A. Adams, Genera, ii. p. 326.
- “ *Campechiensis*, (part.) Fischer, Journ. Conch. 2d ser. iii. p. 49.
- Pholas oblongata*, Say, Journ. Acad. Nat. Sci. 1st ser. ii. p. 320. De Kay, Moll. New York, p. 248. Gibbes, in Tuomey’s Geology of South Carolina. Kurtz, Cat. Shells N. and S. Carolina, p. 3. Stimpson, Check List E. Coast Shells.
- “ *Candeana*, D’Orbigny, Moll. Sagra’s Cuba, p. 215, t. 25, f. 18, 19.
- Dactylina Candeana* Chenu, Manuel, ii. f. 12.
- Hab.*—Southern United States. West Indies.
- Coll. Acad. Nat. Sci. Coll. A. A. Gould, M. D. Coll. Wm. Stimpson, M. D. Coll. Isaac Lea, LL.D.
- Lister’s figure of *D. Campechensis* represents very accurately a large individual of this species, although it is doubtfully referred by some European authors to the next species. The resemblance between this and the next shell, from Western South America, is so great that it would not be surprising if their identity should be established hereafter. The only difference is that our shell

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is narrower in proportion to its length than the South American species, which has about one-third of its posterior surface free from striæ, while the striæ in the *Campechensis* are continued faintly over the entire posterior surface.

Pholas oblongata, Say, has been entirely overlooked by European authors, with the exception of Mr. Hanley, who has referred it doubtfully to *D. dactylus*. It is figured in Tuomey and Holmes' Pleiocene Fossils of S. Carolina, t. 24, f. 5.

D'Orbigny's *Pholas Candean* is a half-grown shell of this species.

The only specimens that I have seen having the dorsal valves belongs to Mr. Isaac Lea. They are identical in form with those of *D. Chilensis*.

D. CHILOENSIS, King. (sp.)

Pholas Chilensis, King, Zool. Journ. v. p. 334, 1832. Gay, Hist. Nat. Chili, viii. p. 381. Sowerby, Monog. Pholas, Thes. Conch. ii. p. 486, t. 102, f. 1, 2. Philippi, Neüer Conch. iii. t. 1, f. 4, 5. D'Orbigny, Voy. p. 498.

Dactylina Chilensis, Chenu, Manuel, ii. f. 14, 15.

" *Campechensis*, (part.) Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 382. H. and A. Adams, Genera, ii. p. 326.

" *Campechiensis*, (part.) Fischer, Journ. Conch. 2d ser. iii. p. 49.

Pholas laqueata, Sowerby, Proc. Zool. Soc. 1849. Sowerby, Monog. Pholas, Thes. Conch. ii. p. 486, t. 103, f. 19, 20.

Hab.—Peru. Chili.

Coll. Acad. Nat. Sci. Coll. Isaac Lea, LL.D. Coll. J. C. Jay, M. D. Coll. G. W. Tryon, Jr.

Pholas laqueata of Sowerby is a mere variety of *Chilensis*, differing in the greater prominence of the ribs and their arched scales.

King, in his description, refers to Molina, Hist. Nat. Chili, p. 179, as authority for the name; but as it would be preposterous to allow such an obscure and scant description as that of Molina's to remain as authority, I have thought it best to use King's name in that connection. Gmelin (Syst. Nat. p. 3217) merely copies Molina's description.

Genus MONOTHYRA, Tryon. 1862.

Gen. Char.—Equivalue; anterior hiatus long and narrow. Accessory plate single, ovately triangular, with the base anterior and the nucleus subcentral. Hinge processes cellular beneath.

M. orientalis, Gmelin. (Species.)

Pholas orientalis, Gmelin, Syst. Nat. 3216. Bosc, Hist. Nat. ii. p. 196. Bruguiere, Encyc. Meth. t. 168, f. 10. Catlow, Conch. Nomenc. p. 4. Chemnitz, Conch. Cab. viii. t. 101, f. 860. Dillwyn, Desc. Cat. p. 36. Hanley, Desc. Cat. p. 5, t. 2, f. 2. Jay, Cat. 4th ed. p. 10. Lamarck, Anim. sans Vert. v. p. 444. Lamarck, Anim. sans Vert. (Desh. edit.) vi. p. 44. Lister, Hist. Conch. t. 431, f. 247. Sowerby, Monog. Pholas, Thes. Conch. ii. p. 486, t. 102, f. 3, 4. Wood, Gen. Conch. t. 14, f. 1, 2. Wood, Index Test. Pholas, t. 2, f. 1.

Dactylina orientalis, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 382.

H. and A. Adams, Genera, ii. p. 326. Chenu, Man. Conch. ii. f. 16.

Fischer, Journ. Conch. 2d ser. iii. p. 49.

Pholas Siamensis, Spengler.

" *dactylus*, Solander MSS. teste Gray.

Hab.—India.

Coll. Acad. Nat. Sci. Coll. Isaac Lea, LL.D. Coll. J. C. Jay, M. D. Coll. G. W. Tryon, Jr.

This species is placed by Sowerby, Gray and Chenu in the genus *Dactylina*, although it is so very different in its single accessory valve. Sowerby's figure 1862.]

of the back of the shell, including the dorsal accessory plate, is very good, and it is strange that the subsequent systematists, H. and A. Adams and Chenu, who must have been acquainted with the character of this plate, still leave the species in *Dactylina*.

Genus *XYLOPHAGA* Turton.

XYLOPHAGA, Turton, Conch. dith. Brit. p. 253, 1822. Gray, Zool. Proc. p. 188, 1847. Gray, Ann. and Mag. Nat. Hist. 2d ser. p. 380, 1851. H. and A. Adams, Genera, ii. p. 326.

Teredo, Turton, Conch. Dict. 1819.

Pholas, Deshayes, in Lamarck, An. sans Vert. vi. 1835.

Xylotrya, Leach, teste Menke, Syn. ed. 2, p. 121, 1830. Gray, Syn. Brit. Mus. p. 76, 1842.

X. dorsalis, Turton.

Xylophaga dorsalis, Turton, Conch. dith. Brit. p. 253, t. 2, f. 4, 5. H. and A. Adams, Genera, iii. t. 89, f. 4, 4 a b c. Alder, Cat. Northumb. Moll. p. 101. Brown, Ill. Brit. Conch. p. 117, t. 50, f. 8—13. Catlow, Conch. Nomenc. p. 3. Chenu, Man. ii. f. 20, 21. Chenu, Encyc. Hist. Nat. Moll. t. 241—244. Fischer, Journ. Conch. 2d ser. iii. p. 49. Fleming, Brit. Anim. p. 455. Forbes and Hanley, Brit. Moll. i. p. 90. t. 2, f. 3, 4. Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 382. Hanley, Desc. Cat. p. 10. Jay, Cat. 4th ed. p. 9. Reeve, Conch. Syst. t. 22. Sowerby, Genera of Shells. Sowerby, Conch. Manual. Sowerby, Illust. Brit. Shells, t. 1, f. 7. Sowerby, Monog. *Xylophaga*, Thes. Conch. ii. p. 503, t. 108, f. 103, 104. Thorpe, Brit. Mar. Conch. p. 32.

Teredo dorsalis, Turton, Conch. Dict. p. 185, 1819.

Pholas xylophaga, Deshayes, in Lam. Anim. sans Vert. vi. p. 47, 1835.

Hab.—England.

Coll. Acad. Nat. Sci. Coll. J. C. Jay, M. D. Coll. G. W. Tryon, Jr.

X. globosa, Sowerby.

Xylophaga globosa, Sowerby, Zool. Proc. p. 110, 1835. Sowerby, Monog. *Xylophaga*, Thes. Conch. ii. p. 503, t. 108, f. 101, 102. H. and A. Adams, Genera, ii. p. 327. Catlow, Conch. Nomenc. p. 3. Chenu, Man. Conch. ii. f. 22, 23. Fischer, Journ. Conch. 2d ser. iii. p. 49. Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 382. Hanley, Desc. Cat. p. 10. Jay, Cat. 4th ed. p. 9.

Pholas gibbosa, D'Orbigny, Voy. Amer. Merid. Moll. p. 501. Gay, Hist. Nat. Chili, viii. p. 381.

Hab.—Valparaiso; inhabiting wood at sixty fathoms.

Coll. J. C. Jay, M. D.

This shell very closely resembles the English species, but may be distinguished by its more depressed dorsal margin, by its greater posterior length, and by the longitudinal portion of the ventral margin being slightly convex in outline, whilst in *X. dorsalis* this margin is concave.

Xylophaga cardissa, Gould, Otia Conchologica, p. 241, Feb., 1862.

Hab.—Mergive Archipelago.

Coll. Dr. A. A. Gould.

I owe to Dr. Gould the pleasure of examining specimens of this new form of *Xylophaga*, which is very distinct from the other species of the genus.

Genus *TALONA*, Gray.

TALONA, Gray, Syn. Brit. Mus. 1840. Gray, Proc. Zool. Soc. p. 188, 1847. Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 381. H. and A. Adams, Genera, ii. p. 329.

Pholas, (part.) Spengler, Sowerby, Hanley, etc.

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T. explanata, Spengler. (Sp.)

Pholas explanata, Spengler, Skrivt. Nat. ii. pt. 1, 1791.

Talona explanata, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii., 1851.
H. and A. Adams, Genera, iii. t. 90, f. 2, 2a. Fischer, Journ. Conch.
2d ser. iii. p. 51. Mörch, Cat. p. 3.

Pholas clausus, Gray, in Bowdich, Elem. 1822. Catlow, Conch. Nomenc. p. 3.
Hanley, Desc. Cat. p. 6, t. 11, f. 8. Jay, Cat. 4th ed. p. 10. Sowerby,
Monog. Pholas. Thes. Conch. ii. p. 498, t. 107, f. 74, 75.

Talona clausa Chenu, Man. Conch. ii. f. 34, 35, 1862.

Pholas candidus, Chemn. Conch. Cab. viii. f. 862, 1785.

Hab.—Western Africa.

Coll. Acad. Nat. Sci. Coll. J. C. Jay, M. D. Coll. Isaac Lea, LL. D. Coll.
G. W. Tryon, Jr.

Genus BARNEA, Leach.

BARNEA, Leach, teste Risso, Hist. Nat. iv. p. 376, 1826.

" Risso, H. and A. Adams, Genera, ii. p. 326, 1853.

Barnia, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. 1851. Leach, Moll. Great
Britain, p. 254, 1852.

Typical Species.

Margins of the valves regularly rounded, hiatus long and narrow.

B. Australasiæ, Gray.

Barnia Australasiæ, Gray, Brit. Mus. Gray, Ann. and Mag. Nat. Hist. 2d
ser. viii. p. 381.

Barnea Australasiæ, Fischer, Journ. Conch. 2d ser. iii. p. 49. H. and A.
Adams, Genera, ii.

Pholas Australasiæ Sowerby, Mon. Pholas, Thes. Conch. ii. p. 488, t. 106,
f. 73.

Hab.—Australia.

This shell closely resembles *B. candida* of England, but may be at once
distinguished by its much larger size and more anterior position of the umbones.

B. Burmanica, Philippi. (Sp.)

Pholas Birmanica, Philippi, Neuer Conchyl. iii. Pholas. t. 1, f. 1.

Barnia Burmanica, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 382.

Barnea Burmanica, H. and A. Adams, Genera, ii. p. 326.

Pholas Bakeri? Deshayes, Woodward's Manual, t. 23, f. 19.

Barnea Bakeri? H. and A. Adams, Genera, ii. p. 326.

Hab.—Burmah.

The shape and sculpture of this shell, as figured by Philippi, remind one
strongly of our *P. costata*; it is much broader than either of the other species
of this section of *Barnea*.

B. Bakeri I have not seen, nor could I find the original description; but the
figure in Woodward appears to be the same as *Burmanica*.

B. candida, Linn. (Sp.)

Pholas candida, Linnæus, Syst. Nat. 1111. Linnæus, Mus. Ulric, p. 469.

Alder, Cat. Northumb. Moll. p. 100. Bosc, Hist. Nat. des Coq. ii. p.
195. Bouchard-Chantereau, Moll. Boulon, p. 7. Brown, Ill. Conch.
Great Britain, p. 115, t. 48, f. 6—10. Bruguière, Encyc. Meth. t. 168,
f. 11. Burrow, Elem. t. 3, f. 4. Catlow, Conch. Nomenc. p. 3. Chem-
nitz, Conch. Cab. viii. p. 358, t. 101, f. 861. Collard des Chêrres, Cat.
Moll. Finisterre, p. 9. Crouch, Introd. Lam. t. 2, f. 11. DaCosta,
Brit. Conch. p. 246. Deshayes, Moll. Expl. Sci. de l'Algerie, p. 109,
t. 9, D. I. f. 4, 5, (Animal.) Deshayes, Traite Elem. i. pt. 2, p. 79, t.

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- 3, f. 13, 14. Deshayes, Encyc. Meth. iii. p. 753. Dillwyn, Desc. Cat. i. p. 36. Donovan, Brit. Shells, iv. t. 132. Fleming, Brit. Anim. p. 457. Forbes and Hanley, Brit. Moll. i. p. 117, t. 4, f. 1, 2. Gerville, Coq. de la Manche, p. 10. Gmelin, Syst. Nat. p. 3215. Gualtieri, Test. t. 105, f. 8. Hanley, Desc. Cat. p. 5, t. 2, f. 3. Jay, Cat. 4th ed. p. 9. Karsten, Mus. Lesk. p. 151. Lamarck, Anim. sans Vert. v. p. 444. Lamarck, (Desb. edit.) vi. p. 44. Lister, Anim. Angl. p. 193, t. 5, f. 39. Macgillivray, Moll. Aberd. p. 306. Mawe, Introd. Conch. t. 3, f. 2. Menke, Syn. p. 73. Middendorff, Mal. Rossica, iii. p. 79. Montagu, Test. Brit. p. 24. Müller, Zool. Dan. prodr. p. 251. Pennant, Brit. Zool. iv. p. 76. Philippi, Enum. Moll. Sicil. i. p. 3 and ii. p. 4. Poli, Test. utr. Sicil. t. 7, f. 12, 13. Potiez et Michaud, Gal. Moll. ii. p. 269. Pultney, Dorset. Cat. p. 26. Schröter, Einleit. Conch. iii. p. 539. Sowerby, Illust. Brit. Conch. t. 1, f. 9. Sowerby, Monog. Pholas, Thes. Conch. ii. p. 488, t. 103, f. 21—23. Thompson, Rep. Fauna Ireland, p. 263. Thorpe, Brit. Mar. Conch. p. 31. Turton, Conch. Dict. p. 144, f. 79. Turton, Conch. dith. Brit. p. 10. Wood, Gen. Conch. p. 79, t. 14, f. 3, 4. Wood, Index Test. Pholas, t. 2, f. 3. Wyatt, Conch. p. 27, t. 3, f. 2.
- Barnia candida*, Leach, Moll. Great Britain, p. 255. Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 382. Gray, Figs. Moll. Anim. t. 338, f. 6.
- Barnea candida*, H. and A. Adams, Genera, ii. p. 326. Chenu, Man. Conch. ii. f. 17, 18. Fischer, Journ. Conch. 2d ser. iii. p. 49.
- Pholas dactyloides*, Della Chiajè, Mem. iv. t. 65, f. 4.
- “ *papyracea*, Spengler, Skrivt. Nat. ii. pt. 1, t. 1, f. 4, 1791. (Not of his diagnosis.) Lister, Hist. Conch. t. 435, f. 278.
- “ *silicula*, Deshayes, in Lam. Anim. sans Vert. vi. p. 45, 1835. Anton, Verzeich. der Conch. p. 1. Catlow, Conch. Nomenc. p. 4. Delessert, Rec. t. 1, f. 19. Hanley, Desc. Cat. p. 6.
- Hab.*—England. Ireland.
- Coll. Acad. Nat. Sci. Coll. J. C. Jay, M. D. Coll. Isaac Lea, LL. D. Coll. G. W. Tryon, Jr.
- B. lanceolata*, D'Orbigny. (Sp.)
- Pholas lanceolata*, D'Orb. Moll. Voy. Amer. Merid. p. 497, t. 77, f. 18, 19.
- Hab.*—Patagonia. South of the Rio Negro.
- This shell appears to be distinct from *B. candida*, although very nearly allied to it. It is not so much inflated across the umbones as that species; it is more narrowly elongate and acuminate at the buccal region, more rounded posteriorly, and the hinge tooth is larger. D'Orbigny's figures also show a vast difference in the great prominence of the concentric raised striae.
- The figures of D'Orbigny represent probably a young shell.
- Subgenus *ANCHOMASA*, Leach.
- ANCHOMASA*, (genus,) Leach, Moll. Great Britain, p. 253.
- Ventral anterior margin of the valves emarginate; hiatus short and wide.*
- B. Manillensis*, Philippi. (Sp.)
- Pholas Manillensis*, Philippi, Zeitschr. für Malak. p. 72, 1847. Philippi, Neuer Conch. iii. Pholas. t. 1, f. 2.
- Barnea Manillensis*, H. and A. Adams, Genera, ii. p. 326. Fischer, Journ. Conch. 2d ser. iii. p. 49.
- Barnia Manillensis*, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 382, 1851.
- Pholas Manilla*, Sowerby, Proc. Zool. Soc. p. 161, 1849. Sowerby, Monog. Pholas, Thes. Conch. ii. p. 487, t. 103, f. 17, 18. Jay, Cat. 4th. edit. p. 10.

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Pholas fragilis, Sowerby, Proc. Zool. Soc. p. 161, 1849. Sowerby, Monog.

Thes. Conch. ii. p. 488, t. 108, f. 92, 93, 1849.

Barnea fragilis, Fischer, Journ. Conch. 2d ser. iii. p. 49.

Barnia fragilis, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 382.

Hab.—Manilla. Philippines.

Coll. Acad. Nat. Sci. Coll. J. C. Jay, M. D. Coll. G. W. Tryon, Jr.

The *Pholas fragilis* of Sowerby is undoubtedly identical with *Manillensis*.

This species differs from *B. similis* in having a different shaped dorsal plate, which is also much smaller in proportion to the valves, which are narrower, with the umbones placed nearer the anterior end; and by the extension of the ribs over the whole posterior surface, which is quite plain in *B. similis*. *Barnea parva* is a wider shell, with the umbones nearer the centre.

B. Parva, Pennant. (Sp.)

Pholas parva, Pennant, Brit. Zool. iv. p. 77, t. 40, f. 13, 1777. Brown, Ill.

Brit. Conch. t. 9, f. 11, 12. Catlow, Conch. Nomencl. p. 4. Dillwyn,

Desc. Cat. i. p. 38. Fleming, Edin. Encyc. vii. p. 100. Fleming, Brit.

Anim. p. 457. Forbes and Hanley, Brit. Moll. i. p. 111, t. 2, f. 2; t. 4.

f. 1, 2. (Animal t. F. f. 3, 3a.) Hanley, Desc. Cat. p. 5, t. 2, f. 6. Jay,

Cat. 4th edit. p. 10. Montagu, Test. Brit. p. 22, t. 1, f. 7, 8. Philippi.

Neuer Conch. iii. *Pholas*, t. 2, f. 2. Sowerby, Illust. Brit. Conch. t. 1,

f. 10. Sowerby, Monog. *Pholas*, Thes. Conch. ii. p. 487, f. 31, 32.

Thorpe, Brit. Mar. Conch. p. 32, f. 71. Turton, Conch. Dict. p. 143.

Turton, Conch. dith. Brit. p. 9. Wood, Gen. Conch. p. 82. Wood,

Index Test. t. 2, f. 6.

Barnia parva, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 382. Gray, Figs.

Moll. Anim. t. 338, f. 10.

Barnea parva, H. and A. Adams, Genera, iii. t. 89, f. 3, 3a, b. Chenu, Man. ii.

f. 19. Fischer, Journ. Conch. 2 ser. iii. p. 49.

Anchomasa Pennantiana, Leach, Moll. Gt. Britain, p. 253.

Pholas crenulatus, Solander. Spengler, Skrivt. Nat. ii. pt. 1, p. 92.

" *dactylus*, var. Deshayes. In Lamarck Anim. sans Vert. vi. p. 45, note.

" *dactyloides*, Lamarck, Anim. sans Vert. v. p. 445. Menke, Syn. p. 73.

" *ligamentina*, Deshayes, Traite Elem. p. 80, t. f. 11, 12. Catlow, Conch.

Nomencl. p. 4.

" *tuberculatus*, Turton, Conch. dith. Brit. p. 5, t. 1, f. 7, 8. Brown,

Illust. Brit. Conch. p. 115, t. 49, f. 12, 13. Chenu, Ill. Conchyl. t. 3,

f. 3. Fleming, Brit. Anim. p. 547. Hanley, Desc. Cat. p. 9. Thorpe,

Brit. Mar. Conch. p. 30. Wood, Index Test. Supp. t. 1, f. 3.

Hab.—England.

Coll. Acad. Nat. Sciences. Coll. J. C. Jay, M. D. Coll. Isaac Lea, LL. D.

Coll. G. W. Tryon, Jr.

Forbes and Hanley (Brit. Moll.), after an examination of the original specimen of Dr. Turton's *Pholas tuberculatus*, pronounced it to be a monstrosity of *B. parva*, and not a synonym of *D. dactylus*, as Gray and others supposed.

B. subtruncata, Sowerby. (Sp.)

Pholas subtruncata, Sowerby, Zool. Proc. p. 69, 1834. Catlow, Conch.

Nomencl. p. 4. D'Orbigny, Moll. Voy. Amer. Merid. p. 499. Hanley,

Desc. Cat. p. 6. Jay, Cat. 4th edit. p. 10. Müller, Syn. Test. p. 236.

Pholas lamellosa, D'Orb. Voy. Am. Merid. p. 498, t. 77, f. 20, 21.

Hab.—Payta, Peru, Isle Plata (*subtruncata*); Patagonia, south of Rio Negro (*lamellosa*.)

Judging from the descriptions, D'Orbigny's species is founded on a variety of *subtruncata* in which the anterior ribs are much more prominent. The obtusely rounded form of the posterior end and the nearly parallel dorsal and ventral margins distinguish this from *B. parva*, to which, however, it is very

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closely allied. It may eventually prove to be a mere variety of that shell. The absence of a posterior accessory plate prevents this species from being placed in the genus *Pholas*, where it is nearly allied to *P. truncata*.

B. Erythræa, Gray.

Barnia Erythræa, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 382, 1851.

Barnea Erythræa, H. and A. Adams, Genera, ii. p. 326.

Hab.—Red Sea.

This shell, which has not yet been figured, seems to be allied to *B. similis*, but is probably distinct.

B. similis, Gray. (Sp.)

Pholas similis, Gray, in Yates' New Zealand. Catlow, Conch. Nomenc. p. 4. Jay, Cat. 4th edit. p. 10. Sowerby, Monog. *Pholas*, Thes. Conch. ii. p. 487, t. 103, f. 12—14.

Barnia similis, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 382.

Barnea similis, H. and A. Adams, Genera, ii. p. 326. Fischer, Journ. Conch. 2d ser. iii. p. 49.

Pholas antipodum, Philippi, Zeitschr. für Malak. p. 71, 1847.

" *antipodarum*, Philippi, Gray, Ann. and Mag. N. Hist. 2d ser. viii. p. 382. 1851.

Hab.—New Zealand.

Coll. Acad. Nat. Sciences. Coll. J. C. Jay, M. D. Coll. G. W. Tryon, Jr.

Genus *NAVEA*, Gray.

NAVEA, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 385.

N. nucifera, Fabricius (sp.)

Pholas nucifera, Fabricius. Spengler, Skrivt. Nat. iv. p. 40, t. 10, f. 4, 9. Fischer, Journ. Conch. 2d ser. iii. p. 50.

Navea nucifera, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 385. H. and A. Adams, Genera, ii. p. 328. Mörch, Cat. p. 2.

According to Dr. Gray, resembling *tenuis*, but appears to be shorter in front and longer and more rounded behind.

N. subglobosa, Gray.

Navea subglobosa, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 385, 1851. Chenu, Man. Conchyl. ii. f. 28, 29. H. and A. Adams, Genera, iii. t. 89, f. 6, 6, a, 6, b. Fischer, Journ. Conchyl. 2d ser. iii. p. 50.

Hab.—California.

N. tenuis, Gray.

Navea tenuis, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 385, 1851. H. and A. Adams, Genera, ii. p. 328. Fischer, Journ. Conchyl. 2d ser. iii. p. 50.

Hab.— ?

Genus *ZIRPHÆA*, Leach.

ZIRPHÆA, Leach. H. and A. Adams, Genera, ii.

Zirphæa, Leach. Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 385, 1851.

Z. constricta, Sowerby (sp.)

Pholas constricta, Sowerby, Proc. Zool. Soc. p. 161, 1849. Sowerby, Monog. *Pholas*, Thes. Conch. ii. p. 489, t. 104, f. 27, 28.

Zirphæa constricta, H. and A. Adams, Genera, ii. p. 327. Fischer, Journ. Conch. 2d ser. iii. p. 50.

Zirphæa constricta, Gray, Ann. and Mag. N. H. 2d ser. viii. p. 385, 1851.

Hab.—Straits of Sunda.

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Fischer (Journ. Conch.) believes this to be an immature shell; however this may be, there can be no doubt that it is a good species.

Z. crispata, Linnæus. (Sp.)

Pholas crispata, Linn. Syst. Nat. 1111. Linn. Mus. Ulric, ii. p. 469. Alder, Cat. Northumb. Moll. p. 100. Anton, Verzeich. der Conchyl. p. 1. Bosc. Hist. Nat. des Coq. ii. p. 195. Bouchard-Chantreaux, Moll. Boulon. p. 7. Brown, Ill. Conch. Gt. Brit. p. 114, t. 48, f. 1—5. Bruguière, Encyc. Meth. t. 169, f. 5—7. Catlow, Conch. Nomenc. p. 3. Chemnitz, Conch. Cab. viii. t. 102, f. 872—874. Collard des Cherres, Cat. Moll. Finisterre, p. 9. Dekay, Moll. N. York, p. 247, t. 32, f. 306, *a*, *b*. Deshayes, Traité Elem. i. pt. 2, p. 77. Dillwyn, Desc. Cat. i. p. 40. Donovan, Brit. Shells, ii. p. 3, t. 62. Fleming, Edinb. Encyc. vii. p. 100. Fleming, Brit. Anim. p. 456. Forbes and Hanley, Brit. Moll. i. t. 4, f. 3, 4, 5. Gerville, Cat. Coq. Manche, p. 10. Gmelin, Syst. Nat. p. 3216. Gould, Invert. Mass. p. 27. Hanley, Desc. Cat. p. 7. Jay, Cat. 4th edit. p. 10. Lamarck, Anim. sans Vert. v. p. 445. Lamarck, (edit. Brux.) ii. p. 518. Lamarck, (edit. Desh.) vi. p. 46. Lister, Anim. Angl. p. 192, t. 5, f. 38. Macgillivray, Moll. Aberd. p. 306. Montagu, Test. Brit. p. 23. Olafsen, Isl. f. 4, 6. Pennant, Brit. Zool. iv. p. 77, t. 40, f. 12. Petiver, Gazoph. t. 79, f. 13. Potiez et Mich. Gal. ii. p. 268. Pultney, Dorset Cat. p. 27. Russell, Essex (Mass.) Journ. Nat. Hist. i. p. 50. Schröeter, Einleit. iii. p. 541. Schumacher, Essai d'un Nov. Syst. p. 96. Sowerby, Illust. Brit. Shells, t. 1, f. 11. Sowerby, Monog. *Pholas*, Thes. Conch. ii. p. 489, t. 104, f. 37. Spengler, Skrivt. Nat. ii. pt. 1, p. 96. Stimpson, Shells N. England, p. 25. Stimpson, Check-List, E. Coast Shells. Thorpe, Brit. Mar. Conch. p. 29. Turton, Conch. Dict. p. 146. Turton, Conch. dith. Brit. p. 6. Wheatley, Cat. Shells U. S. p. 2. Wood, Gen. Conch. t. 15, f. 4, 5. Wood, Index Test. t. 2, f. 5. Wyatt, Conch. p. 28.

Zirphæa crispata, H. and A. Adams, Genera, iii. t. 89, f. 5—5a. Mörch. Cat. p. 3. Fischer, Journ. Conch. 2d ser. iii. p. 50. Chenu, Man. ii. f. 26, 27.

Zirfæa crispata, Gray, Figs. Moll. Anim. t. 338, f. 5 and t. 339, f. 5. Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 385.

Thurlosia crispata, Leach, Moll. Gt. Britain, p. 252.

Mya crispata, Linn. Faun. Suec. 2125.

Pholas bifrons, Da Costa, Brit. Conch. p. 242, t. 16, f. 4.

Solen crispus, Gmelin, Syst. Nat. p. 3228.

Pholas crista, Blainville, Malacol. t. 79, f. 7.

" *parva*, Da Costa, Conch. p. 247. Donovan, Brit. Shells, ii. t. 69. Bruguière, Encyc. Meth. t. 169, f. 5. Lister, Hist. Conch. t. 436, f. 279.

Hab.—England, France, Sweden, Denmark, Northern Coast United States, West Coast America? (Carpenter.)

Coll. Acad. Nat. Sciences. Coll. Isaac Lea, LL. D. Coll. J. C. Jay, M. D. Coll. G. W. Tryon, Jr.

Z. ? Juliana, Adanson. (Sp.)

Pholas Juliana, Adans. Senegal, p. 260, t. 19, f. 1.

Zirphæa ? Juliana, H. and A. Adams, Genera, ii. p. 327. Fischer, Journ. Conch. 2d ser. iii. p. 50.

Zirfæa ? Juliana, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 385.

" *Mulan*, Gray, Figs. Moll. Anim. t. 338, f. 2.

Hab.—Senegal.

1862.]

Subfamily JOUANNETINÆ, Tryon.

Genus PHOLADIDEA, Turton.

PHOLADIDEA, Turton, Conch. Dict. p. 147, 1819. Gray, Zool. Proc. p. 188, 1847.
Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. 1851. Chenu, Man.
Conchyl. ii. Fischer, Journ. Conchyl. 2d ser. iii. H. and A. Adams,
Genera, ii.

Pholadidoidea, Goodall, teste Blainville, Dict. Sci. Nat. xxxix. p. 535, 1826.

Pholadididea, Agassiz, Nomenc. Zool. 1846.

Cadmusia, Leach, Moll. Gt. Brit. p. 254, 1852.

Pholidæa, Leach, teste Swainson, Malacol. 1840.

**Siphonal valves without any tubular elongation and not folded.*

P. papyracea, Solander. (Sp.)

Pholas papyracea, Solander, MSS. Turton, Conch. dith. Brit. p. 2, t. 1, f. 1—4. Brown, Ill. Brit. Conch. p. 114, t. 49, f. 4, 6, 7, 8, 9. Catlow, Conch. Nomenc. p. 4. Chenu, Ill. Conch. Pholas, t. 3, f. 1. Fleming, Brit. Anim. p. 456. Hanley, Desc. Cat. p. 9. Jay, Cat. 4th edit. p. 10. Mawe, Conch. t. 3, f. 5. Philippi, Conchyl. iii. Pholas, t. 2, f. 3. Reeve, Conch. Syst. t. 2, f. 3. Sowerby, Genera, Pholas, f. 3. Sowerby, Conch. Man. f. 56. Sowerby, Monog. Pholas, Thes. Conch. ii. p. 497, t. 106, f. 66. Thorpe, Brit. Mar. Conch. p. 29. Wood, Index Test. Supp. t. 1, f. 3.

Pholadidea papyracea, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 384. Gray, Figs. Moll. Anim. t. 338, f. 8. H. and A. Adams, Genera, iii. t. 90, f. 1, 1a, 1b. Chenu, Man. Conch. ii. f. 30, 31. Fischer, Journ. Conch. 2d ser. iii. p. 51. Forbes and Hanley, Brit. Moll. i. p. 123, t. 5, f. 3—6; Animal t. F, f. 4. Sowerby, Ill. Brit. Shells, t. 1, f. 12. Woodward, Man. t. 23, f. 20.

Pholas lamellata (young shell), Turton, Conch. Dith. Brit. p. 4, t. 1, f. 5, 6. Brown, Ill. Brit. Conch. p. 114, t. 49, f. 10, 11. Chenu, Ill. Conch. Pholas, t. 3, f. 2. Fleming, Brit. Anim. p. 456. Wood, Index Test. Supp. t. 1, f. 3.

Pholas striata, Blainville, Man. Malacol. t. 8 bis, f. 7. Cuvier, Reg. Anim. (edit. Griffith), t. 8, f. 1. Cuvier (Henderson, edit.), t. 41, f. 1. Wyatt, Conch. t. 3, f. 5.

Pholadidea loscombia, Turton, Conch. Dict. p. 147.

Pholadidea Goodallii, Blainville, Dict. Sc. xxxvii. p. 532.

Cadmusia Solanderiana Leach, Moll. Gt. Brit. p. 254, t. 12, f. 1, 2.

Pholas Vibonensis, (fossil,) Philippi, Enum. Moll. Sicil. ii. p. 4, t. 13, f. 5.

Zirfæa? Vibonensis, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 385.

Hab.—Europe.

Coll. Acad. Nat. Sci. Coll. Isaac Lea, LL. D. Coll. J. C. Jay, M. D. Coll. Geo. W. Tryon, Jr.

Pholas lamellata of Turton is the young of this species, although for a long time it was considered distinct. The differences between the young and mature shells in this family are so great, that in several cases the former have been described as different. Even the mature shell varies much, and the result has been the creation of a number of species which more recent authors have been obliged to suppress.

P. spathulata, Sowerby. (Sp.)

Pholas spathulata, Sowerby, Zool. Proc. p. 162, 1849. Sowerby, Monog. Pholas, Thes. Conch. ii. p. 497, t. 106, f. 69, 70.

Pholadidea spathulata, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 384. H. and A. Adams, Genera, ii. p. 329. Fischer, Journ. Conch. 2d ser. iii. p. 51.

Hab.—New Zealand.

[April,

This shell somewhat resembles *P. papyracea* in its external markings, but it is narrower, longer, more acuminate posteriorly and the impressed rib more oblique. The form of the cup-shaped appendage is also different.

P. sulcata, Brown. (Sp.)

Pholas sulcata, Brown, Ill. Conch. Gt. Brit. p. 115, t. 48, f. 17, 18.

Pholadidea sulcata, H. and A. Adams, Genera, ii. p. 329. Fischer, Journ. de Conchyl. 2d ser. iii. p. 51. Forbes and Hanley, Brit. Moll. i. p. 128.

Hab.—England.

Only a single valve of this shell has been found; it agrees very nearly with the young of *P. papyracea*, but Capt. Brown is confident of its specific value.

P. ovoidea, Gould. (Sp.)

Pholas ovoidea, Gould, Jour. Bost. Soc. N. Hist. vi. p. 388, t. 15, f. 1.

Parapholas ovoidea, H. and A. Adams, Genera, ii. p. 330. Fischer, Journ. Conch. 2d ser. iii. p. 52.

Pholadidea ovoidea, Carpenter, Rep. on W. Coast Shells. Carpenter, Zool. Proc. 1856, p. 198.

Hab.—Lower California.

Coll. A. A. Gould, M. D.

This species probably belongs in the genus *Pholadidea*, although its position cannot be accurately determined on account of the loss of its dorsal valves. Its form and sculpture will readily distinguish it from the other species.

Subgenus TALONELLA, Gray.

TALONELLA, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 385, 1851.

Siphonal valves without any tubular prolongation, and with a longitudinal and transverse fold.

P. tridens, Gray.

Pholas (Talonella) tridens, Gray, Brit. Mus. Sowerby, Monog. *Pholas*, Thes. Conch. ii. p. 498, t. 106, f. 60, 61.

Pholadidea tridens, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 385. H. and A. Adams, Genera, ii. p. 329. Fischer, Journ. Conchyl. 2d ser. iii. p. 51.

Hab.—Monte Christo.

The form of the cup distinguishes this curious little species from all others. Although so small, the shell is adult, as is evidenced by the presence of the anterior ventral callous plate.

Subgenus HATASIA, Gray.

HATASIA, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 385, 1851.

Siphonal valves with a tubular shelly prolongation.

1. *P. melanura*, Sowerby. (Sp.)

Pholas melanura, Sowerby, Proc. Zool. Soc. p. 70, 1834. Sowerby, Monog. *Pholas*, Thes. Conch. ii. p. 499, t. 107, f. 78, 79. Catlow, Conch. Nomencl. p. 4. Conrad, Journ. Acad. Nat. Sc. 2d ser. ii. p. 335, 1854. D'Orbigny, Moll. Voy. Amer. Merid. p. 499. Müller, Syn. Test. Viv. p. 238.

Pholadidea melanura, Gray, Ann. and Mag. 2d ser. viii. p. 385. H. and A. Adams, Genera, ii. p. 329. Carpenter, Rep. on West Coast Mollusca. Carpenter, Cat. Mazatlan Shells, p. 8. Chenu, Man. Conch. ii. f. 32, 33. Fischer, Journ. Conch. 2d ser. iii. p. 51.

1862.]

Penitella Wilsonii, Conrad, Proc. Acad. Nat. Sc. p. 156, Feb. 1849. Conrad, Journ. Acad. Nat. Sc. 2d ser. i. p. 279, t. 39, f. 4.

Hab.—Lower California.

Coll. Acad. Nat. Sci. Coll. J. C. Jay. M. D. Coll. G. W. Tryon, Jr.

This splendid shell may be readily distinguished from the other two species of the subgenus *Hatasia* by its much larger size. In the form of its cup-shaped appendage it is allied to the following species:

By a typographical error in Conrad's description of *P. Wilsonii* in the Journal of the Academy, reference is made to fig. 5 instead of fig. 4; this has led Dr. Gray to consider the figure a bad representation of the species, and to mistake the scope intended to be given by Mr. Conrad to the genus *Penitella*.

P. quadrata, Sowerby. (Sp.)

Pholas quadrata, Sowerby, Zool. Proc. p. 71, 1834. Sowerby, Monog. *Pholas*, Thes. Conch. ii. p. 499, t. 106, f. 62, 63. Catlow, Conch. Nomenc. p. 4. D'Orbigny, Moll. Voy. Amer. Merid. p. 500. Hanley, Desc. Cat. 4th edit. p. 10. Müller, Syn. Test. Viv. p. 238.

Pholadidea quadrata, Gray, Ann. and Mag. 2d ser. viii. p. 385. H. and A. Adams, Genera, ii. p. 329. Fischer, Journ. Conch. 2d ser. iii. p. 51.

Hab.—Monte Christo.

Coll. J. C. Jay, M. D.

Resembles *tubifera* very closely, but the posterior appendage is four-lobed, whilst in *tubifera* it consists of two reflected lobes; from *P. tridens* it may be distinguished, besides the subgeneric differences, by its anterior dorsal plates being more spread out over the dorsal surface of the shell.

P. tubifera, Sowerby. (Sp.)

Pholas tubifera, Sowerby, Proc. Zool. Soc. p. 71, 1834. Sowerby, Monog. *Pholas*, Thes. Conch. ii. p. 499, t. 106, f. 64, 65. Adams, Panama Shells, p. 302. Catlow, Conch. Nomenc. p. 4. D'Orbigny, Moll. Voy. Amer. Merid. p. 499. Hanley, Desc. Cat. p. 8. Jay, Cat. 4th edit. p. 10. Müller, Syn. Test. Viv. p. 238.

Pholadidea tubifera, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 385. H. and A. Adams, Genera, ii. p. 329. Fischer, Journ. Conchyl. 2d ser. iii. p. 51.

Hab.—Panama; West Colombia.

Coll. J. C. Jay, M. D.

Genus *PARAPHOLAS*, Conrad.

PARAPHOLAS, Conrad, Proc. Acad. Nat. Sc. p. 121, Dec. 1848. Journ. Acad. Nat. Sc. 2d ser. i. pt. 3, p. 214, and ii. pt. 4, p. 335. Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 380. H. and A. Adams, Genera, ii.

The genus *Penitella* has been referred by many authors to the synonymy of this genus. Mr. Conrad is almost universally credited with *Penitella*; which, however he merely adopted from Valenciennes, without giving any description of its characters.

Dr. Gray includes the *P. penita* of Conrad under a section of *Parapholas*, described as having a single impressed rib and single posterior umbonal valve; while the other species have two impressed ribs and the posterior dorsal cavity divided.

I have thought it best to restore for this shell the original generic name of *Penitella*.

P. Californica, Conrad.

Pholas Californica, Conrad, Journ. Acad. Nat. Sc. vii. p. 236, t. 18, f. 5. Catlow, Conch. Nomenc. p. 3. Hanley, Desc. Cat. p. 8, t. 9, f. 43.

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- Jay, Cat. 4th edit. p. 9. Sowerby, Monog. Pholas, Thes. Conch. ii. p. 491, t. 102, f. 5, 6, 7.
- Parapholas Californica*, Conrad, Proc. Acad. Nat. Sc. p. 121, 1848. Conrad, Journ. Acad. Nat. Sc. 2d ser. i. p. p. 214, and ii. p. 335. Carpenter, Zool. Proc. p. 209, 1856. Carpenter, Rep. on W. Coast Mollusca. Carpenter, Check-List W. Coast Shells.
- Pholas Janelli*, Deshayes, Proc. Zool. p. 357, 1839. Deshayes, Guerin's Mag. Zool. t. 14, 15, 16, 1840. Catlow, Conch. Nomencl. p. 3. Chenu, Ill. Conch. Pholas, t. 3, f. 5.
- Parapholas Janelli*, H. and A. Adams, Genera, ii. p. 330. Chenu, Man. Conch. ii. f. 41, 42. Fischer, Journ. Conch. 2d ser. iii. p. 52.
- Martesia Californica*, Chenu, Mon. Conch. ii. f. 53.
- Hab.*—California.
- Coll. Acad. Nat. Sciences. Coll. J. C. Jay, M. D. Coll. G. W. Tryon, Jr.
- P. quadrizonalis*, Spengler. (Sp.)
- Pholas quadrizonalis* (young shell), Spengler. Sowerby, Monog. Pholas, Thes. Conch. ii. p. 492, t. 108, f. 88, 89.
- Parapholas quadrizonalis*, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. H. and A. Adams, Genera, iii. t. 90, f. 4, 4a. Fischer, Journ. Conch. 2d ser. iii. p. 52.
- Pholas Incii* (adult), Sowerby, Zool. Proc. 1849. Sowerby, Monog. Pholas, Thes. Conch. ii. p. 491, t. 105, f. 45, 46.
- Hab.*—Torres' Straits.

Genus PENITELLA, Valenciennes.

- PENITELLA, Valenciennes, Voy. Venus, atlas, t. 24, (no description), (part.) Journ. Conrad, Acad. Nat. Sc. 2d ser. ii. p. 335.
- Parapholas* (part.), Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. Carpenter, Zool. Proc. 1856.
- Pholadidea* (part.), Carpenter, Rep. on W. Coast Mollusca and Check-List. I cannot find that the text of the Mollusca of Voy. Venus was published, but the figure and the name printed on the plate sufficiently indicate the genus. The three other species of Valenciennes I am unable to make out. No. 2 resembles *Martesia striata*. No. 4 is a very young shell.
- P. penita*, Conrad. (Sp.)
- Pholas penita*, Conrad, Journ. Acad. Nat. Sc. vii. p. 237, t. 18, f. 7. Jay, Cat. 4th edit. p. 10.
- Parapholas penita*, Carpenter, Zool. Proc. p. 210, 1856. Carpenter, Rep. on West Coast Mollusca.
- Pholadidea penita*, Carpenter, Check-List W. Coast Shells. Carpenter, Rep. on W. Coast Mollusca.
- Pholas concamerata*, Deshayes, Rev. Zool. p. 357, 1839. Deshayes, Guerin's Mag. Zool. t. 17, 1840. Chenu, Ill. Conchyl. Pholas, t. 3, f. 4. Sowerby, Monog. Pholas, Thes. Conch. ii. p. 497, t. 106, f. 67, 68.
- Parapholas concamerata*, Chenu, Man. ii. f. 43, 44. Fischer, Journ. Conch. 2d ser. iii. p. 52. H. and A. Adams, Genera, ii. p. 330. Gray, Ann. and Mag. N. H. 2d ser. viii. p. 383.
- Pholas cucullata*, Gray, Syn. Br. Mus. 1840.
- Penitella Conradi*, Valenciennes, Voy. Venus, atlas, t. 24, f. 1. Conrad, Journ. Acad. Nat. Sc. 2d ser. ii. p. 335.
- Pholas Darwinii*, Sowerby, Monog. Pholas, Thes. Conch. ii. p. 490, t. 107, f. 76, 77.
- Zirfæa? Darwinii*, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 385.

Jouannetia Darwinii, H. and A. Adams, ii. p. 330. Fischer, Journ. Conch. 2d ser. iii. p. 51. Chenu, Manuel, ii. f. 39, 40.

Pholas cornea? Sowerby, Zool. Proc. 1834, p. 72. Catlow, Conch. Nomenc. p. 3. Hanley, Desc. Cat. p. 9.

Hab.—California, (penita.) W. Columbia, (*cornea*.) Chiloe (*Darwinii*.) Coll. Acad. Nat. Sciences.

P. Darwinii, Sowb. is the young of this species; I have also included Sowerby's *P. cornea*, as his description seems in the main to correspond, I cannot understand why several of Sowerby's and D'Orbigny's species were omitted from Sowerby's Monograph and are not contained in Gray. Nor is any reference made to them.

Genus JOUANNETIA, Desmoulins.

JOUANNETIA, Chas. Desmoulins, Bull. Linn. Soc. Bordeaux, ii. p. 244. Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 382. H. and A. Adams, Genera, ii. p. 330. Chenu, Man. ii. f. 36. Fischer, Journ. Conch. 2d ser. iii. p. 51.

Triumphalia, Sowerby, Monog. Thes. Conch. ii. p. 500, 1849. Sowerby, Zool. Proc. 1849.

Pholas, (part.) Deshayes, in Lam. An. sans Vert. vi. p. 46.

**Valves with two impressed radiating grooves.*

J. Cumingii, Sowerby. (Sp.)

Triumphalia Cumingii, Sowerby, Zool. Proc. p. 161, 1849. Sowerby, Monog. *Triumphalia*, Thes. Conch. ii. p. 502, t. 106, f. 56, 57.

Jouannetia Cumingii, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 382. H. and A. Adams, Genera, ii. p. 330. Chenu, Man. Conch. ii. f. 38. Fischer, Journ. Conch. 2d ser. iii. p. 51.

Hab.—Philippines.

This beautiful little species merits the name of the following instead of that which it bears, being almost entirely spherical.

J. globosa, Quoy. (Sp.)

Pholas globulosa, Quoy, Voy. Astrolabe, Mollusques, p. 549, t. 85, f. 16—18.

Triumphalia globosa, Sowerby, Proc. Zool. Soc. p. 160, 1849. Sowerby, Monog. *Triumph.* Thes. Conch. ii. p. 501, t. 106, f. 54, 55.

Jouannetia globosa, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 382. H. and A. Adams, Genera, iii. t. 90, f. 3, 3*a b*. Chenu, Man. ii. f. 36. Fischer, Journ. Conch. 2d ser. iii. p. 51.

Jouannetia globulosa, Gray, Figs. Moll. Anim. t. 338, f. 3.

Hab.—Philippines.

Coll. Acad. Nat. Sci. Coll. G. W. Tryon, Jr.

This shell is not so round as *J. Cumingii*, being somewhat ovate in form. It is also a smaller species, and differs in the posterior margin of the right valve being toothed. In the latter respect it resembles *J. pectinata*, but the teeth are larger and not so numerous, and the surface of the valves is bisulcate.

***Valves with a subcentral impressed radiating groove.*

Subgenus PHOLADOPSIS, Conrad.

Genus PHOLADOPSIS, Conrad, Proc. Acad. Nat. Sci. p. 156, 1849.

As Conrad's type species differs from the others in having but one radiating groove, Dr. Gray has very properly separated it as a subgenus.

J. pectinata, Conrad. (Sp.)

Pholadopsis pectinata, Conrad, Journ. Acad. Nat. Sci. 2d ser. i. p. 279, t. 39, f. 3.

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Jouannetia pectinata, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 383.
H. and A. Adams, Genera, ii. p. 330. Fischer, Journ. Conch. 2d ser.
iii. p. 51.

Triumphalia pulcherrima, Sowerby, Zool. Proc. p. 161, 1849. Sowerby,
Monog. Triumph. Thes. Conch. ii. p. 501, t. 106, f. 58, 59.

Jouannetia pulcherrima, Chenu, Man. ii. f. 37.

Hab.—California. W. Colombia.

Genus *MARTESIA*, Leach.

MARTESIA, Leach, MSS. Blainville, Dict. Sci. Nat. 1824. Blainville, Malacol.
p. 632, 1825. Gray, Zool. Proc. p. 188, 1847. Gray, Ann. and Mag.
Nat. Hist. 2d ser. viii. p. 380.

Mactresia, Gray, Syn. Brit. Mus. p. 91, 1842. (Typographical error.)

**Valves with two impressed ribs, the hinder one oblique; the anterior dorsal marginal reflection depressed.*—Gray, Ann. and Mag. Nat. Hist. p. 383, 1851.

M. branchiata, Gould. (Sp.)

Pholas branchiata, Gould, Bost. Proc. p. 290, 1845. Jay, Cat. p. 9.
Sowerby, Monog. Pholas, Thes. Conch. ii. p. 493, t. 108, f. 82, 83.

Martesia branchiata, Gray, Ann. and Mag. 2d ser. viii. p. 383. H. and A.
Adams, Genera, ii. p. 331. Fischer, Journ. Conch. 2d ser. iii. p. 52.

Hab.—Africa.

Coll. J. C. Jay, M. D.

This shell differs from the following in the dorsal plate being bilobed posteriorly, around a portion of the dorsal posterior integument, and in the absence of radiating crenulations on the anterior third of the surface of the valve.

M. calva, Sowerby. (Sp.)

Pholas calva, Sowerby, Proc. Zool. Soc. p. 69, 1834, and p. 162, 1835.
Sowerby, Monog. Pholas, Thes. Conch. p. 493, t. 105, f. 51—53.
Catlow, Conch. Nomenc. p. 3. Müller, Syn. Test. Viv. p. 237.
Hanley, Desc. Cat. p. 7.

Parapholas calva, Carpenter, Mazatlan Shells, p. 9.

Martesia calva, Gray, Ann. and Mag. viii. p. 383. H. and A. Adams, Genera,
ii. p. 331. Carpenter, Rep. on W. Coast Mollusca. Chenu, Man. ii.
f. 45—47. Fischer, Journ. Conch. 2d ser. iii. p. 52.

Pholas acuminata, Sowerby, Zool. Proc. p. 70, 1834. Sowerby, Monog.
Pholas, Thes. Conch. ii. p. 492, t. 105, f. 48—50. Catlow, Conch.
Nomenc. p. 3. Hanley, Desc. Cat. p. 8, t. 9, f. 30. Jay, Cat. 4th ed.
p. 10. Müller, Syn. Test. Viv. p. 237.

Parapholas acuminata, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. H. and
A. Adams, Genera, ii. Carpenter, W. Coast Report, Check List, and
Mazatlan Shells, p. 12.

Martesia acuminata, Chenu, Man. ii. f. 56.

Parapholas bisulcata, Conrad, Journ. Acad. Nat. Sci. 2d ser. i. p. 279, t. 39,
f. 5.

Hab.—California. Mazatlan. Panama.

Cab. Acad. Nat. Sci. Cab. J. C. Jay, M. D. Cab. G. W. Tryon, Jr.

The very variable nature of the dorsal plate has caused the erection of three species for this shell. Mr. P. P. Carpenter, in his Catalogue of Mazatlan Shells, says of *P. acuminata*, "The author of this species distinguishes it from *calva* by the shape of the laminæ and posterior portion, which are variable in both forms, and by the character of the umbonal shield. This last is the only constant character of difference. It is not only smaller, not projecting beyond the dorsal plate, (which is not the result of age, being found in 1862.]

all the specimens,) but, in all the specimens allowing of observation, it is turned in all around, instead of at the anterior portion only, as in *calva*. The external surface also is generally rougher, and the posterior gap smaller, not displaying the bipartite lamina so clearly. Still, as the shells exactly agree in all other respects, it is probable that these differences only result from changes in situation. All the *calvæ* were taken out of *Spondylus*; all the *acuminatæ* were sent loose; and, from their extremely perfect condition, were probably extracted from clay or wood. If the latter, the irregularities of the decaying timber might cause the roughening of the plate-surface. The original specimens of *acuminata*, however, were taken out of argillaceous limestone."

Specimens in Coll. Acad. Nat. Sci. exhibit intermediate characters.

****Valves with a single subcentral impressed rib; the anterior dorsal reflection close-pressed, and furnished with an elevated internal rib.**—Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 383.

M. curta, Sowerby. (Sp.)

Pholas curta, Sowerby, Zool. Proc. p. 71, 1834. Sowerby, Monog. *Pholas*, Thes. Conch. ii. p. 944, t. 104, f. 33, 34. Hanley, Desc. Cat. p. 9. Jay, Cat. 4th ed. p. 10. Müller, Syn. Test. p. 239, t. 108, f. 105.

Pholadidea curta, Carpenter, Rep. on W. Coast Mollusca.

Martesia curta, Gray, Ann. and Mag. viii. p. 384. H. and A. Adams, Genera, ii. p. 331. Chenu, Man. ii. f. 51. Fischer, Journ. Conch. 2d ser. iii.

Hab.—Panama.

Coll. Acad. Nat. Sci. Coll. J. C. Jay, M. D.

M. intercalata, Carpenter.

Martesia intercalata, Carpenter, Cat. Mazatlan Shells, p. 13.

Hab.—Mazatlan.

M. multistriata, Sowerby. (Sp.)

Pholas multistriata, Sowerby, Zool. Proc. 1849. Sowerby, Monog. *Pholas*, Thes. Conch. ii. p. 494, t. 104, f. 35, 36.

Martesia multistriata, H. and A. Adams, Genera, ii. p. 331. Fischer, Journ. Conch. 2d ser. iii. p. 52. Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 383.

Hab.—Australia.

"Resembling *Ph. curta*, but the striæ on the umbonal part of the anterior are very much finer, and the posterior termination is elongated. The dorsal shield is more oval, rounded anteriorly, and acuminate posteriorly."—Sowerby.

M. obtecta, Sowerby. (Sp.)

Pholas obtecta, Sowerby, Zool. Proc. 1849. Sowerby, Monog. *Pholas*, Thes. Conch. ii. p. 496, t. 108, f. 80, 81.

Martesia obtecta, Gray, Ann. and Mag. 2d ser. viii. p. 384. H. and A. Adams, Genera, ii. p. 331. Fischer, Journ. Conchyl. 2d ser. iii. p. 52.

Hab.—Philippines.

Coll. Acad. Nat. Sci. Coll. G. W. Tryon, Jr.

The two-lobed dorsal plate, (which from numerous specimens appears to be a permanent character,) together with the greater size of the shell and some difference in the sculpture, are the characters which distinguish this shell from *M. multistriata*; it would not be surprising, however, if specimens from other localities would prove that this shell is only a well-grown form of *multistriata*.

[April,

M. ovum, Gray.

Pholas ovum, Gray, in Wood, Index Test. Supp. f. 4. Catlow, Conch. Nomencl. p. 4. Hanley, Desc. Cat. p. 7.

“ *ovata*, (Gray,) Sowerby, Monog. *Pholas*, Thes. Conch. ii. p. 493, t. 107, f. 71, 72. Jay, Cat. 4th ed. p. 10.

Martesia ovum, Gray, Ann. and Mag. viii. p. 383. H. and A. Adams, Genera, ii. p. 331. Fischer, Journ. Conch. 2d ser. iii. p. 52.

Hab.—West Indies. Hanley.

Much larger than either of the other species of this section of the genus.

****Valves with a single subcentral impressed rib; the anterior dorsal reflection erect, separated from the outer surface of the valve.*—Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 384.

M. aperta, Sowerby. (Sp.)

Pholas aperta, Sowerby, Zool. Proc. 1849. Sowerby, Monog. *Pholas*, Thes. Conch. ii. p. 491, t. 108, f. 99, 100.

Martesia aperta, Gray, Ann. and Mag. 2d ser. viii. p. 384. H. and A. Adams, Genera, ii. p. 331. Fischer, Journ. Conch. 2d ser. iii. p. 52.

Hab.—Straits of Sunda.

The character of the striae is different in this species from *M. cuneiformis*, the undulations being finer and more angular. The shell is a young one, the ventral plate being absent.

M. Australis, Gray.

Martesia Australis, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 384. H. and A. Adams, Genera, ii. p. 331. Fischer, Journ. Conch. 2d ser. iii. p. 52.

Hab.—N. W. Australia.

This species has not yet been figured, but Dr. Gray states that the anterior waved concentric edges are rather distant,—fewer than in *M. striata*.

M. cuneiformis, Say. (Sp.)

Pholas cuneiformis, Say, Journ. Acad. Nat. Sci. ii. p. 322. DeKay, Moll. New York, p. 248. Kurtz, Cat. p. 3. Sowerby, Monog. *Pholas*, Thes. Conch. ii. p. 495, t. 104, f. 38, 39, t. 108, f. 86, 87. Wheatley, Cat.

Pholadidea cuneiformis, Stimpson's Check List.

Martesia cuneiformis, Fischer, Journ. Conch. 2d ser. iii. p. 52. H. and A. Adams, Genera, ii. p. 331. Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 384.

Pholas Edwardsii, Gray, Syn. Brit. Mus. 1820.

“ *rudis*, “ “ “ “ “

Hab.—Southern United States. West Indies.

Coll. Acad. Nat. Sci. Coll. Isaac Lea, L.L.D. Coll. G. W. Tryon, Jr.

M. rivicola, Sowerby. (Sp.)

Pholas rivicola, Sowerby, Zool. Proc. 1849. Sowerby, Monog. *Pholas*, Thes. Conch. ii. p. 496, t. 108, f. 90, 91. Adams and Reeve, Moll. Voy. Samarang. p. 84, t. 23, f. 5.

Martesia rivicola, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 384. H. and A. Adams, Genera, ii. p. 331. Fischer, Journ. Conch. 2d ser. iii. p. 52.

Hab.—Pantai River.

This very distinct species is found burrowing in floating piles, on the Pantai River, twelve miles from its mouth, where the water is perfectly fresh.

1862.]

M. striata, Linnæus. (Sp.)

Pholas striata, Linnæus, Syst. Nat. p. 1111. Beau, Cat. Coq. Guadeloupe, p. 27. Bose, Hist. Nat. des Coq. ii. p. 195. Brown, Ill. Brit. Conch. p. 115, t. 49, f. 5—8. Catlow, Conch. Nomenc. p. 4. Chemnitz, Conch. Cab. t. 102, f. 867—871. Donovan, Brit. Shells, t. 116. Forbes and Hanley, Brit. Conch. i. p. 120. Gualtieri, Test. t. 105, f. F. Dillwyn, Desc. Cat. p. 37. Gmelin, Syst. Nat. p. 3215. Hanley, Desc. Cat. p. 7. Jay, Cat. 4th ed. p. 10. Mawe, Conch. t. 3, f. 1. Menke, Syn. p. 73. Montagu, Brit. Test. pp. 26 and 559. Reeve, Conch. Syst. t. 24, f. 2. Rumphius, Mus. t. 46, f. 8. Sowerby, Genera Pholas, f. 2. Sowerby, Illust. Brit. Shells, t. 1, f. 13. Sowerby, Monog. Pholas, Thes. Conch. ii. p. 494, t. 104, f. 40—42. Spengler, Besch. Berl. Naturg. iv. t. 5, f. 1—5. Thorpe, Brit. Mar. Conch. p. 31. Wood, Gen. Conch. p. 83, t. 16, f. 1, 2, 3, 4, 8. Wood, Index Test. Pholas, t. 2, f. 7. Turton, Conch. Diet. p. 147. Turton, Conch. dith. Brit. p. 11.

Martesia striata, Leach, Gray Ann. and Mag. Nat. Hist. 2d ser. viii. p. 384. H. and A. Adams, Genera, iii. t. 90, f. 5, 5a. Chenu, Man. Conch. ii. f. 48—50. Fischer, Journ. Conch. 2d ser. iii. p. 52. Mörch, Cat.—p. 2. Woodward, Manual, t. 23, f. 21.

Pholas pusilla, Linnæus, Syst. Nat. p. 1111. Bose, Hist. Nat. des Coq. ii. p. 195. Catlow, Conch. Nomenc. p. 4. Dillwyn, Desc. Cat. i. p. 38. D'Orbigny, Moll. Voy. Amer. Merid. p. 497. D'Orbigny, Moll. Sagra's Cuba, p. 214. Donovan, Brit. Shells, iv. t. 117. Schumacher, Essai d'un Nov. Syst. p. 96. Spengler, Skrivt. Nat. ii. pt. 1, p. 95.

Pholas clavata, Lamarck, Anim. sans Vert. v. p. 446. Lamarck, (ed. Desh.) vi. p. 46. Anton, Verzeichn. Conch. p. 1. Bruguière, Encyc. Meth. t. 170, f. 1—3. Hanley, Desc. Cat. p. 7.

Martesia clavata, Swainson, Malacol. f. 122, l.

Pholas conoides, Fleming, Brit. Anim. p. 457.

“ *lignorum*, Spengler, Berl. Ges. Nat. iv.

“ *nana*, Pultney, Dorset. Cat. p. 27.

“ *falcata*, (Junior,) Wood, Gen. Conch. t. 16, f. 5—7. Wood, Index Test. Pholas. t. 2, f. 8? Hanley, Desc. Cat. p. 7.

“ *terediniformis*, (Junior,) Sowerby, Zool. Proc. 1849. Sowerby, Mon. Pholas. Thes. Conch. ii. p. 490, t. 108, f. 97, 98.

Pholas semicostata, (Junior,) Lea, Bost. Proc., Nov., 1844, t. 24, f. 1. Sowerby, Monog. Pholas, Thes. Conch. ii. p. 495, t. 108, f. 84, 85. Jay, Cat. 4th ed. p. 10. Stimpson's Check List.

Coll. Acad. Nat. Sci.; specimens from England, West Indies and Philippines. Coll. J. C. Jay, M. D. Coll. Isaac Lea, LL.D. Coll. G. W. Tryon, Jr.

Linnaeus described the West Indian shell as a distinct species, under the name of *Pholas pusilla*, but Lamarck united the two, as *P. clavata*; *P. terediniformis* and *P. falcata* are about half-grown shells, and *P. semicostata* is a very young individual. The Philippine Island specimens do not differ in any respect from the West Indian. This species differs from *M. cuneiformis* in the shape of the dorsal plate and in the anterior concentric striæ being angular instead of regularly curved.

M. corticaria, Adams. (Sp.)

Pholas corticaria, Gray, MSS. Sowerby, Monog. Pholas, Thes. Conch. ii. p. 495, t. 108, f. 94—96. C. B. Adams, Contrib. to Conch. p. 75.

Pholas Beauviana, Recluz, Journ. Conch. iv. p. 49, t. 2, f. 1, 2, 3. (1853.)

Zirphæa Beauviana, H. and A. Adams, Genera, ii. p. 327. Beau. Cat. Coq. Guadeloupe, p. 27. Fischer, Journ. Conch. 2d ser. iii. p. 50.

Pholas Caribæa, D'Orbigny, Moll. Sagra's Cuba, p. 216, t. 25, f. 20—22, 1853.

“ *Hornbeckii*, D'Orb. “ “ “ p. 217, t. 25, f. 23—25, 1853.

[April,

Martesia Hornbeckii, Chenu, Manuel, ii.

Hab.—West Indies.

The *Pholas Beauiana*, of Recluz, and *P. Caribæa*, D'Orb., are descriptions of the full growth of this shell. *P. Hornbeckii* is a young shell, and is considerably magnified in the plate of Sagra's Cuba, although no reference to that fact is contained there. The shell is figured without the dorsal plate.

The date 1846 is affixed to the descriptions by D'Orbigny, but he does not mention where they were described previously.

This shell was sent to England from Jamaica, by Prof. Adams, with the MSS. name of *P. rosea*, subsequently altered to *P. corticaria*. Mr. Hanley affirmed them to be a variety of *P. striata*, and, in deference to his opinion, Adams suppressed the description.

Sowerby quotes "Gray MSS." for this shell, but Dr. Gray relinquishes his name in favor of Adams, although he considers the shell a synonym of *M. cuneiformis*. I have not seen this species, but conceive from the figures of Sowerby that it is a good one.

I find the following differences in the dorsal plates of the three allied West Indian species:—

In *striata*, somewhat hexagonal, the anterior and posterior margins emarginate, the anterior lateral margins slightly concave, and the posterior lateral margins somewhat convex.

In *cuneiformis*, diamond-shaped, the anterior portion broader and more obtuse.

In *corticaria*, broadly halberd-shaped, truncate and three-sided at the posterior end, with the central margin emarginate.

Addenda.

Pholas cordata, Schröter, Conch. iii. p. 544, t. 9, f. 22—24. Bosc, Hist. Nat. des Coq. ii. p. 196. Bruguière, Encyc. Meth. t. 169, f. 8—10. Catlow, Conch. Nomencl. p. 3. Gmelin, Syst. Nat. p. 3216. Wood, Gen. Conch. p. 85. Wood, Index Test. f. 9.

Hab. — ? Two specimens found in a mass of Madreporæ.

I am not able to place this shell in any of the foregoing genera. It appears to be immature, and it is probable that the anterior ventral hiatus is closed in the adult by a callous plate, as in *Martesia*, etc.; but it differs from that genus in the single dorsal plate being placed anterior to, instead of over, the umbones.

Gray, Adams and Sowerby do not mention the species. Should this species be rediscovered, and found to exhibit the above distinctive characters, as indicated by Schröter's plate, I would suggest for it the generic name *SCHROTTERIA*, in honor of its describer.

Descriptions of certain Species of DIURNAL LEPIDOPTERA, found within the limits of the United States and of British America. No. 3.

BY WM. H. EDWARDS.

- | | |
|---|---|
| 1. <i>Argynnis Nokomis</i> , nov. sp. | 7. <i>Lycæna Pembina</i> , nov. sp. |
| 2. <i>Grapta Faunus</i> , nov. sp. | 8. " <i>Shasta</i> , nov. sp. |
| 3. <i>Thecla Californica</i> , nov. sp. | 9. " <i>Scudderii</i> , Edw. female. |
| 4. " <i>viridis</i> , nov. sp. | 10. <i>Parnassius Smintheus</i> , Doubleday |
| 5. " <i>affinis</i> , nov. sp. | 11. <i>Limenitis Eulalia</i> , Doubleday. |
| 6. <i>Lycæna Behrii</i> , nov. sp. | |

ARGYNNIS NOKOMIS, nov. sp.

Male. Expands $3\frac{1}{2}$ inches.

Upper side uniform bright fulvous, a little dusky next base; hind margin edged with a fine black line which is preceded by a heavy parallel line; the

1862.]